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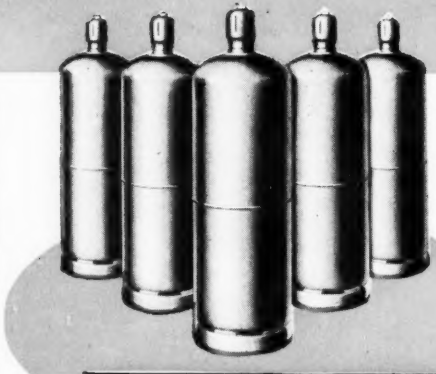

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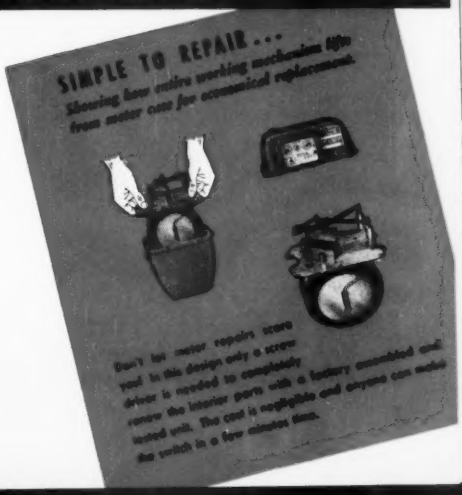
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CONTENTS JUNE, 1948

Special Index For Safety Issue, Page 62

The Flow of the Fuel from Source to Consumer—Foldout Opposite 64

Letters 65

The Purpose of the Issue..... 68

Guest Editorial: Safety..... .....By Franklin R. Fetherston 71

Fire Loss Distribution Chart..... 72

Bulk Plants 75

Fuel Delivery 101

Installation 119

Fire Protection 143

Insurance 163

Training 190

Codes 210

Associations 226

Calendar of Events..... 236

New Products 240

Winnipeg Company Flies Propane to Isolated Consumers 252

Service at a Loss May Become Profit in Long Run to Dealer..... .....By Harry L. Spooner 258

Can Now Build LP-Gas Ranges to "CP" Specifications 266

The Trade 269

Classified 305

Advertisers 307

BUTANE-PROPANE News

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CONTENTS FOR SAFETY ISSUE, JUNE, 1948

(For Regular Contents See Page 2)

Bulk Plants—What Makes Them Safe.. 75
Build Safety Into the Plant..... 76
How to Unload Tank Cars—A Specific Routine that Has Proved Practical and Safe..... 82
Before You Start to Unload..... 82
Plant Pump Procedure..... 85
The Compressor Method..... 85
When You Disconnect—Six Points to Watch 86
Unloading Transport Trucks — It's the Driver's Responsibility..... 87
What to Check Before Unloading.... 87
Plant Pump Procedure..... 89
Truck Pump Operation..... 90
The Compressor Method..... 90
When You Disconnect—Nine Points to Watch 91
How to Fill Tank Trucks..... 92
Cylinders—There's a Right Way to Fill Them 93
The Cylinder Retest 95
Apparatus for Testing Cylinders.... 96
Clean Plants Pay—Good Maintenance Promotes Safety 98

Fuel Delivery — Good Methods Bring New Customers and Hold Old Ones 101
Detail of Delivery Tank Truck..... 102
Safety Is Built Into the Tank Truck 103
Filling Consumer Tanks—It Must Be Done Right 103
Commercial and Industrial Deliveries 105
Changing Cylinders—The Right Way Is the Easy Way 107
The House Trailer Consumer..... 109
Safe Rules for Highway Driving.... 111
Truck Upkeep Keeps Down Accidents 113
Defensive Driving 115
Marine Shipments—In Containers or Bulk 117

Installation—Proper Methods Promote Safety and Customer Satisfaction.. 119
Aboveground Systems—Safe and Accessible Locations 120
Underground Systems 122
Installing the Yard Line—Make It Tight 124
Self-Service Units — Made Safe for the Customer to Handle..... 125
Cylinders—There's a Proper Way to Install Them 127
Appliances — Location Is Important for Safety 128
House Piping — It's Permanent — Do It Well 131
Agricultural 133
Commercial 134
Industrial 135
Town Plants—Designed and Built for Safe Operation 137
Internal Combustion Engines—What's Needed to Insure a Safe Operating Power Unit 139
The Butane Service Station—Make It Fool-Proof for Attendants and Public 141

Fire Protection — Prevention, Control, Extinguishment 143
Characteristics of the Fuel..... 144
Don't Fear Fire—LP-Gas Is the Easiest Kind to Control..... 148
Extinguishing Fires with Dry Compound 151
Types and Uses of Extinguishers.... 152
When Trucks Are Exposed to Fire.. 160
Odorants—A Safeguard for the Consumer's Protection 162

Insurance—How to Get It and How to Keep It 163
Types the Dealer Needs..... 163
Are You Adequately Covered?..... 164
Insurance Is an Operating Cost..... 167
Free Inspection Plan for Your Plant 167
Will Your Plant Pass This Test?.... 170
Tank Truck Inspection Report..... 176
Tank and Piping Report..... 182

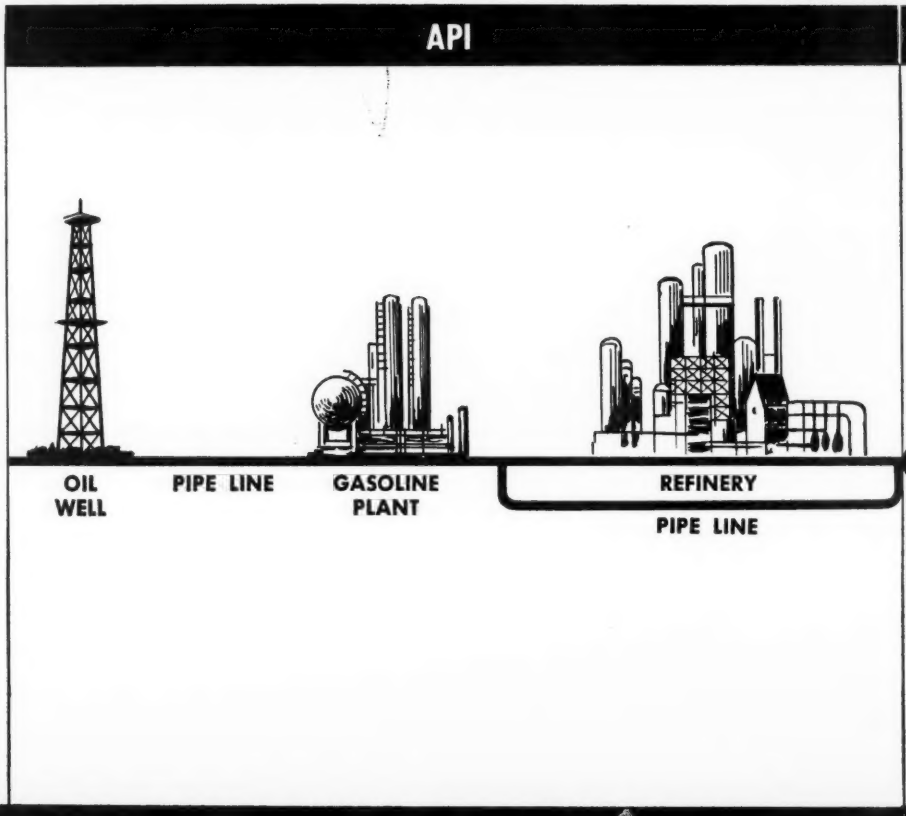
Training—Makes Operations Safer.... 190
The Dealer's Responsibility..... 192
The Employe's Part..... 192
Qualifying Employes—Start the New Man Right 198
Make the Safety Meeting Click..... 204
Driver Qualifications 208

Codes—The LPGA Model Laws Are Guides for States and Towns..... 210
A Model Law for States..... 215
A Model Municipal Ordinance..... 216
The Industry Is Organized for Safety 221

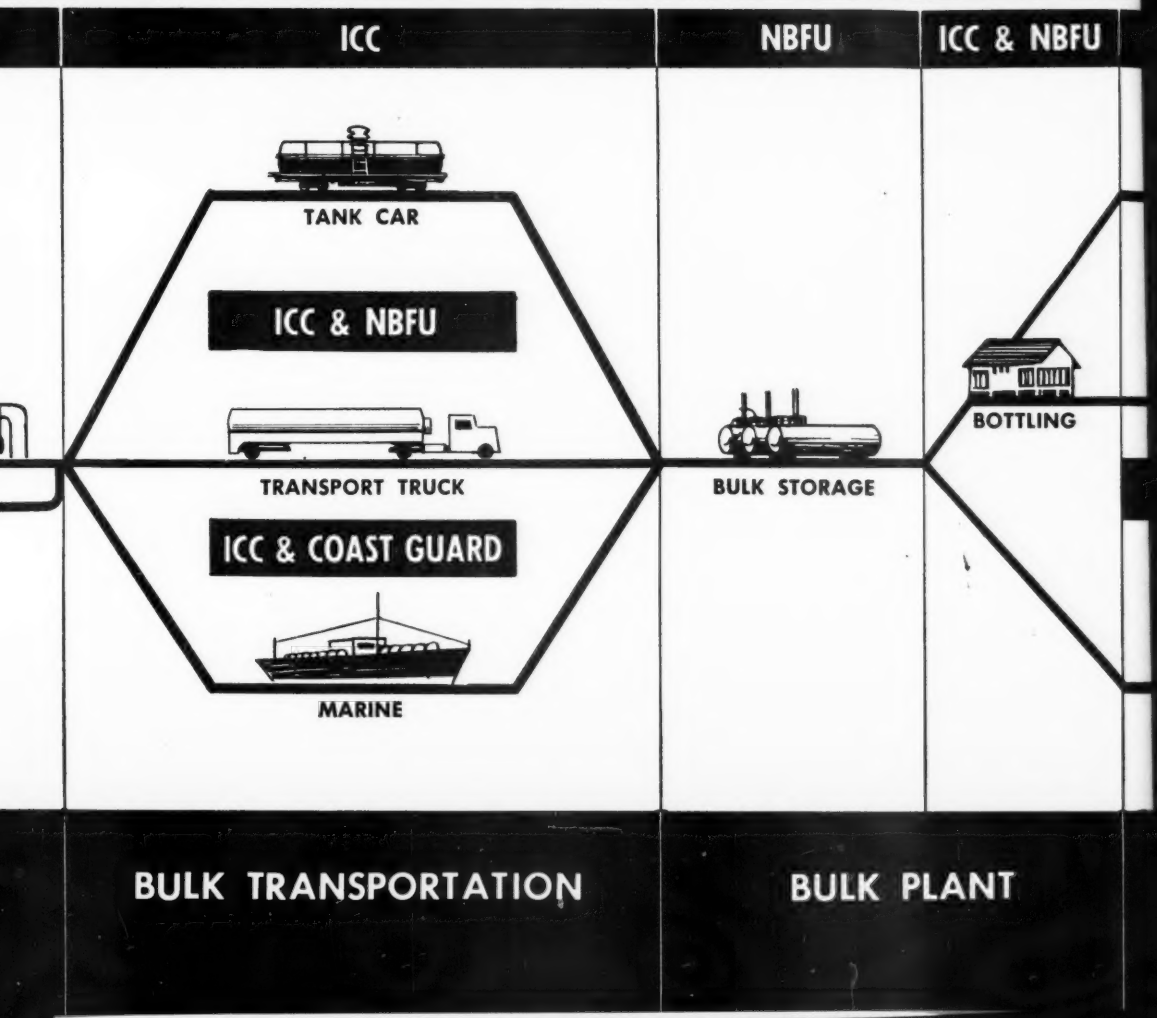
Acknowledgments 225

128
131
133
134
135
137
139
141
143
144
148
151
152
160
162
163
163
164
167
167
170
176
182
190
192
192
198
204
208
210
215
216
221
225

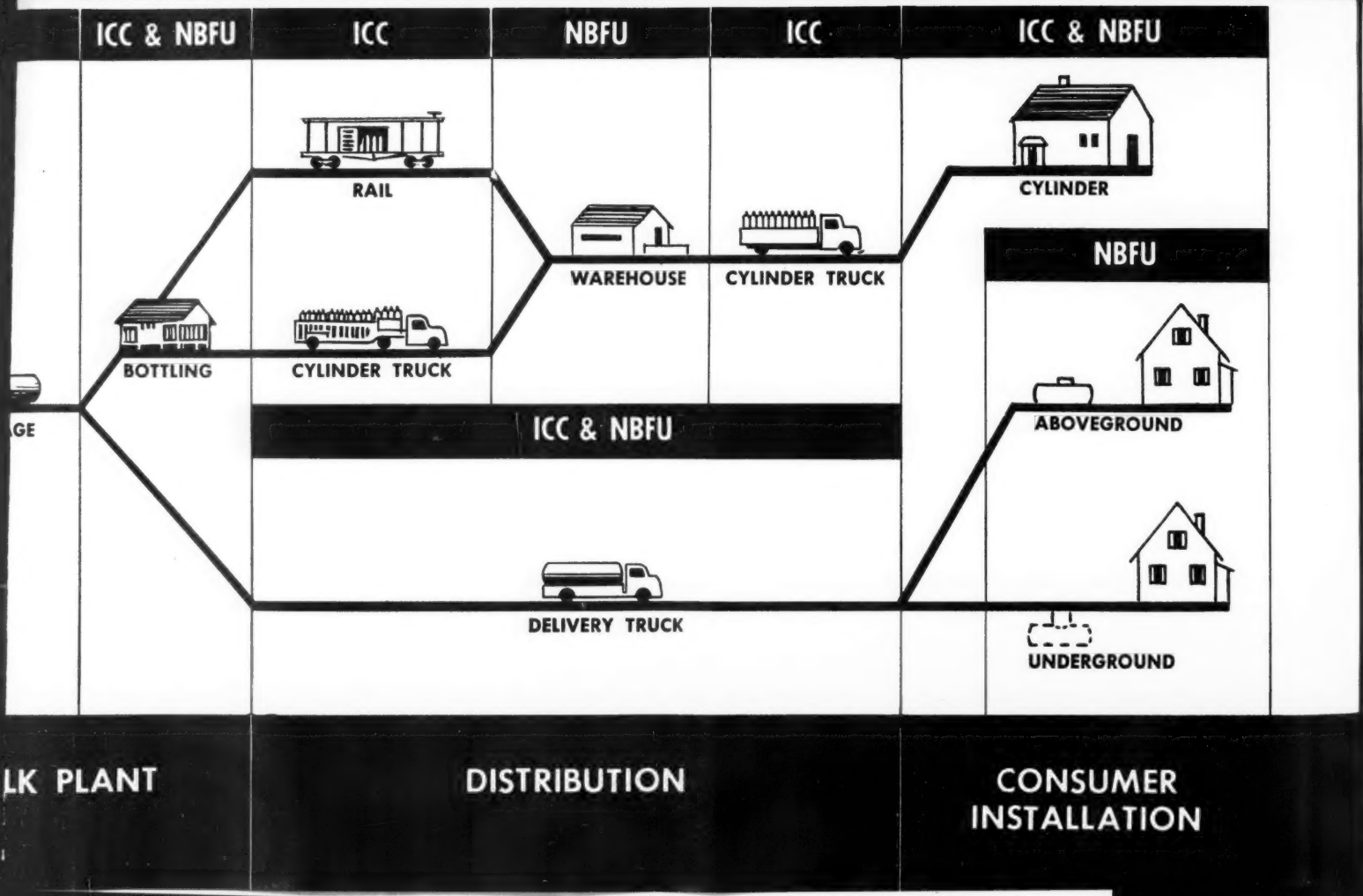
SAFETY STANDARDS GUIDE THE



THE FLOW OF LIQUEFIED PETROLE



PETROLEUM GAS FROM SOURCE TO CONSUMER



LETTERS

Gentlemen:

In installing a 20,000 Btu custom air heater for LP-Gas, we had difficulty in obtaining a hot, blue flame. Changing of the orifice and primary air supply did not improve situation. However, in increasing the regulator pressure from 11 inches of water to 17 inches of water, we obtained good results.

Please advise us if this would be a dangerous procedure to follow. In forming your opinion, please note that we are operating at an elevation of 6000 feet above sea level.

W.R.

California

We advise you to contact the manufacturer of the heater in question with this problem.

You can expect to lose about five per cent input capacity for each 1000 feet of elevation and it may be that the particular burner design compensated the air-gas flow by increasing the pressure.

We would not recommend raising the pressure above the AGA specifications unless advised by the manufacturer that it is satisfactory.—Ed.

•

Gentlemen:

We have encountered a problem regarding which we think you might possibly be able to help us.

We are running a 100 ft. 1¼ in. vapor line at 6 oz. from a 1000-gal. tank to a furnace (60,000) and cook stove.

Is there any danger to an above-ground line at temperatures of zero to 40° below zero.

H.L.

Alberta

At 40° below zero it is possible that you will have condensate form in the line.

We would recommend a buried line for such temperatures installed with a slope back to the tank and a condensate or drip pocket installed at that point to revaporize any drips that might accumulate.

The safety valve on the down stream side of your pressure regulator should remove any danger of high pressure being caused by re-vaporization faster than the appliance use.—Ed.

•

Gentlemen:

Can cylinder filling be successfully done from a tank truck? If so, is there any special equipment necessary? Is it legal to do this if it is possible?

G.S.

Missouri

In some sections of the country cylinders have been specially fitted with fill valves for filling from trucks.

When cylinders are filled in this manner, they no longer are considered under ICC regulations and the location of the container when being filled is determined by the NBFU Pamphlet No. 58, Division II.

Means for weighing the cylinder or determining the contents must be provided.

Most operators making bulk deliveries have found that cylinder fills are not economical and prefer the use of larger tanks by the customer.—Ed.

•

Gentlemen:

We have just had a discussion in our organization regarding the correct method of checking a tank car of propane into a plant storage. In other words, what do you feel is the correct method or formula to use in determining how many gallons of propane gas have been pumped out of a tank car into storage?

These are the facts: We received a tank car of propane with a specific gravity of .508 and a weight per

gallon of 4.2308, the vapor pressure 200 pounds psi, 100° F. The bill of lading showed gross gallons 10,299 at 62°F and net gallons at 60° of 10,268.

The temperature of the tank car when we received it and unloaded it was 39°. The temperature of our storage tank was 30° and we had in storage 42% of a water capacity tank of 21,684, or 9,107 gallons of propane. When we finished pumping all that we could out of the tank car, we had 86%, or 18,648 gallons of propane at a temperature of 37°.

Please figure for us exactly how many gallons of propane you figure that we pumped from this tank car and explain to us how you arrived at that answer.

O.S.

Oregon

For a correct inventory, all gauging must be reduced to a base temperature for comparison. 60°F has been accepted by the industry for these calculations.

Also, consideration must be given to the vapor content of the tank above the liquid level.

Taking your receipt as an example, the following steps are necessary:

(1) Computation of product on hand before unloading:

$$.42 \times 21{,}684 \times 1.047 = 9535 \text{ gals. @ } 60°\text{F.}$$

$$\frac{.58 \times 21{,}684 \times 66.3 \times 520}{36.5 \quad 7.5 \quad 14.7 \quad 590} = \frac{}{9755}$$

220 gals. @ 60 in vapor space

9755 tot. in hand.

Where

.42 = Liquid gauge
21,684 = Water capacity of tank
1.047 = Correction factor for temperature

(See Page 51, Handbook Butane-Propane Gases)

.58 = Vapor space in tank
66.3 = Absolute pressure of propane @ 30°F. (See Page 26, Handbook Butane-Propane Gases)
14.7 = Atmospheric pressure
36.5 = cu. ft. of propane @ 60°F and 1 atmosphere pressure (See Page 22, Handbook Butane-Propane Gases)
520 = Absolute temp. equivalent of 60°F
490 = Absolute temp. equivalent of 30°F
7.5 = Gallons in 1 cu. ft. of space

(2) Computation of product on hand after unloading:

$$.86 \times 21{,}684 \times 1.0365 = 19{,}329 \text{ gallon @ } 60°\text{F}$$

$$\frac{.14 \times 21{,}684 \times 73.7 \times 520}{36.5 \times 7.5 \times 14.7 \times 483} = \frac{}{19{,}388}$$

59 gal. @ 60 in vapor space

19,388 total on hand after unloading

19,388—9755=9633 gal. @ 60°F received

Bill of lading 10,268 gal. @ 60°F

$$=$$

Shortage 635 gallons

Part of this shortage can be accounted for in vapor returned to tank car. This would amount to approximately 215 gallons to 220 gallons.

Based on this, you had a transfer loss of around 415 gallons which may have been left in the car, lost in transit, or lost or diverted during unloading operations.—Ed.

•

Gentlemen:

Can you tell me if there are any state laws concerning the installation of LP-Gas equipment in the state of Colorado?

We are contemplating a sales and distributing plant there and want to be sure there are no laws of that state we might overlook concerning such venture.

As far as we know there are no laws concerning it which might be prohibitive but wondered if you could inform us.

A.D.P.

Missouri

Yes, there is a very comprehensive law in Colorado. You may obtain a copy free by writing to John E. Cronin, State Inspector of Oils, 300 Logan St., Denver, Colo.—Ed.

•

Gentlemen:

I am planning to do some repair work on my 15,000 gallon butane bulk storage tank and want to drain it, remove some of the outlets and weld them over with steel plate.

Can you give me information on

the best way to remove the combustible mixture? I can get a fog nozzle from the local fire department and fill the tank with fog before welding. Or would it be more advisable to use CO_2 before welding?

I also want to install new pop-off valves. Can you give me the required distance from the top of the tank to the top of the valve?

G.W.M.

Oregon

Field welding on an unfired pressure vessel will void the code label unless the work is performed by a certified welder and under the jurisdiction of a shop qualified to do this work.

After the welding has been completed, the tank must be hydrostatically tested according to the code by a certified boiler inspector and new papers made up for the tank.

Before cutting into your tank, it should be thoroughly gas free. Water flooding is not sufficient for this purpose. If steam is not available, a portable steam unit could be employed and the tank should be steamed out for at least four hours and then carefully checked with a combustible gas indicator to be sure there are not gas vapors present.

It is possible to control the combustibility of the tank vapors by the introduction of CO_2 gas, but we would not recommend this, unless there was a thoroughly qualified expert on hand to direct the work.

There is no special requirement in the distance from the tank shell to the safety valve. The discharge of the safety valve should be piped vertically and a recommended stack height is 10 feet from the top of the tank.—Ed.

•

Gentlemen:

In your experience have you found any particular pipe seal (or compound) particularly satisfactory over a long period of time? Please advise the make most recommended.

Also, is black pipe inferior to galvanized insofar as the reaction of gas?

J.E.C.

California

There are two pipe seals made especially for the liquefied petroleum gas industry which are advertised in BUTANE-PROPANE *News*.

One is made by the Radiator Specialty Co., Charlotte, North Carolina, which is called "Titeseal," and another is made by the Rector Well Equipment Co., Houston, Texas, called "Rectorseal."

Black pipe is better than galvanized pipe for use with gas, although there are some codes that call for galvanized pipe.

However, the limited amount of sulphur that is sometimes found in liquefied petroleum gas may work upon the galvanized pipe to form corrosion. Another good feature about black pipe is that it can be welded while galvanized pipe cannot.—Ed.

•

Gentlemen:

Advise me what type of heat we can install in our bottled gas plant. It is a cement block building, size 40 x 40, 12-ft. ceiling, cement floor. Also, how far away our heating plant would have to be.

C.W.C.

Delaware

We would recommend a hot water or low pressure steam heating installation for your bottle filling building.

This building will require considerably more heat than normal for a similar sized building used for other purposes as it is necessary to provide ventilation. Also, the cold cylinders brought into the building, as well as the cold LP-Gas, will absorb a lot of heat.

The building appears to be rather large for just a bottle filling operation. It may be possible to segregate the bottle filling room from the balance of the building by the construction of a fire wall and provide for sufficient heat for this section so a workman will be comfortable, and heat the balance of the building in a more normal manner.

The steam plant or hot water heater should be located in such a way as to prevent the chance of any gas from the filling operation being able to get to the flame which is the source of heat for the system.

There are various ways of doing this, but we are unable to make a direct recommendation as we are not familiar with your plant layout or operations.—Ed.

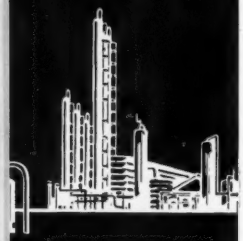
OUR READERS are invited to submit to our technical editor any installation, service, or operational problems which they cannot solve for themselves. There is no charge for this service. More than 600 letters asking for different kinds of information were received last year.—Editor.

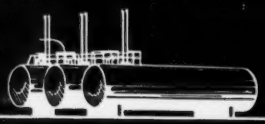
THE PURPOSE O

The purpose of this issue of Butane-Propane News is to present a compilation of safety information gleaned from the literature of the liquefied petroleum gas industry.

Standards and safe practices have been formulated by the industry as a result of long experience with the fuel and careful investigation of its characteristics. If they are followed by handlers and consumers, hazards of use are minimized.

The rules contained in the National Board of Fire Underwriters Pamphlet No. 58 are the basis of the minimum standards for safe distribution and storage of the fuel



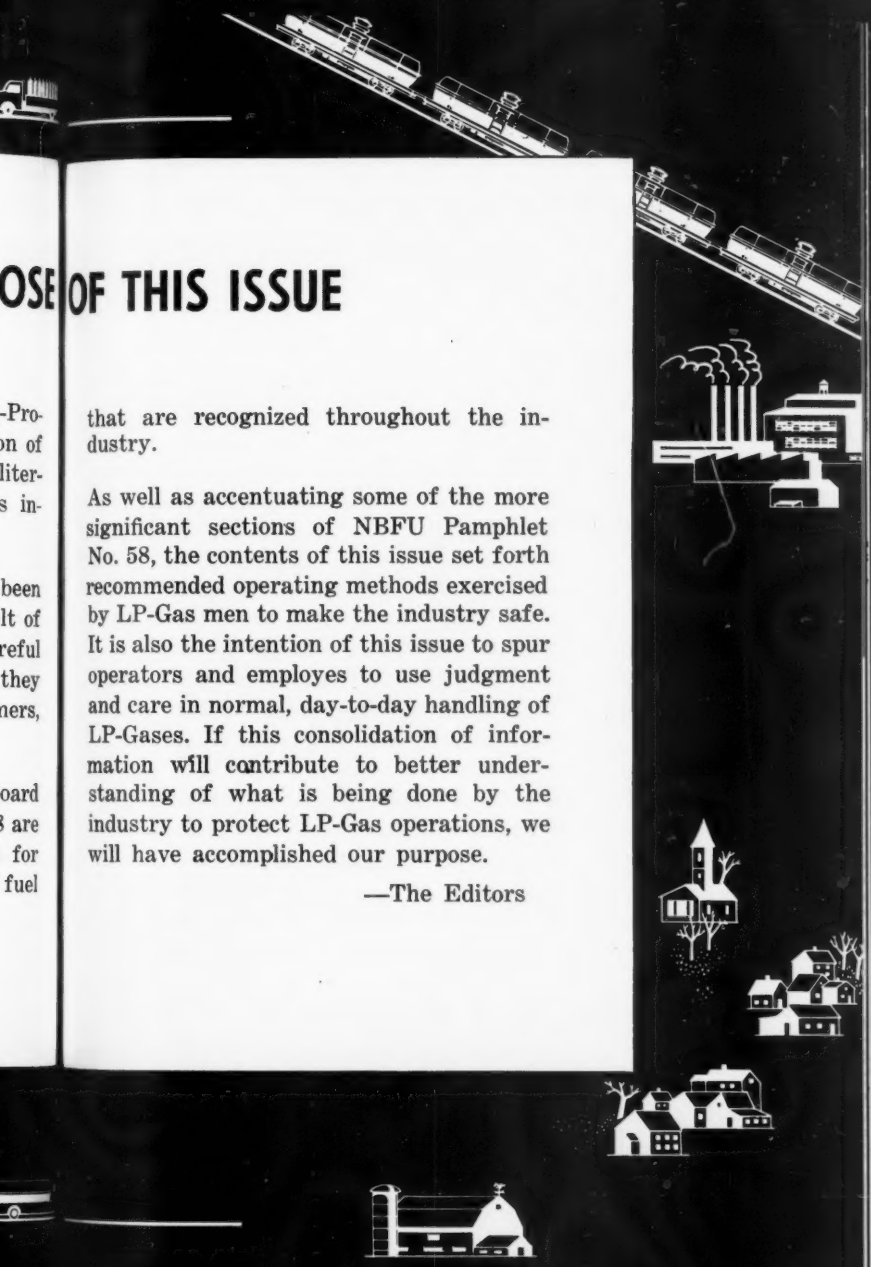


OSE OF THIS ISSUE

that are recognized throughout the industry.

As well as accentuating some of the more significant sections of NBFU Pamphlet No. 58, the contents of this issue set forth recommended operating methods exercised by LP-Gas men to make the industry safe. It is also the intention of this issue to spur operators and employes to use judgment and care in normal, day-to-day handling of LP-Gases. If this consolidation of information will contribute to better understanding of what is being done by the industry to protect LP-Gas operations, we will have accomplished our purpose.

—The Editors



FRANKLIN R. FETHERSTON

Guest Editor

Vice President, Liquefied Petroleum Gas Association, Inc., in charge of Technical Division, and Secretary-Treasurer, Compressed Gas Manufacturers Assn., Inc.

Safety

By FRANKLIN R. FETHERSTON

IT is perhaps appropriate that this editorial should concern safety and safety practices in our industry, and that it should urge the reader to observe carefully the precautions and recommendations which are contained in this issue.

Safety is a relative thing, and involves elements that are mechanical and human. We can deal adequately with the mechanical elements through engineering design, specifications and supervision. The human element, however, is considerably less tangible. It is a personal matter.

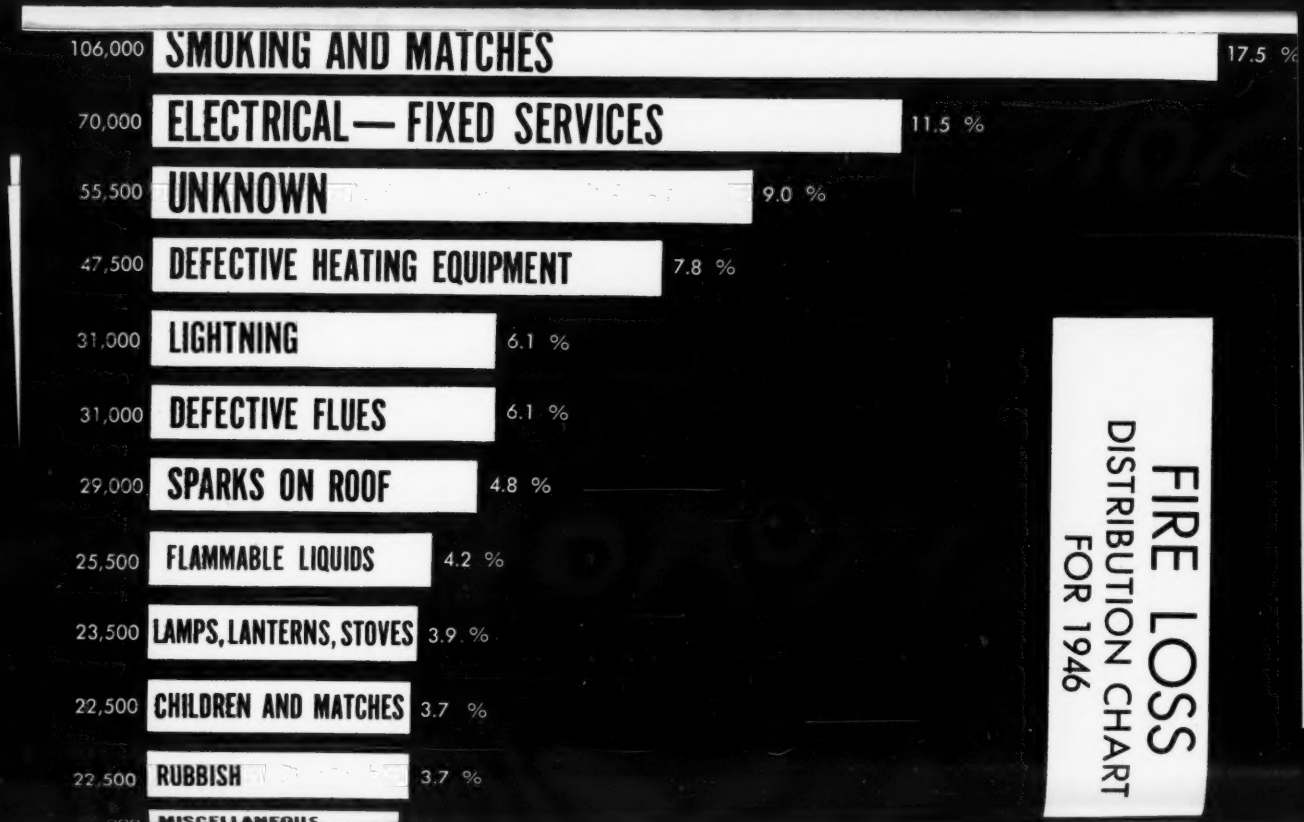
Human failures are responsible for the vast majority of accidents that occur, both in our industry and in others. And if we are to make any real progress in reducing both the number and seriousness of accidents, we must improve the operating instructions that are given to the man on the job. Accidents are expensive, unnecessary and preventable.

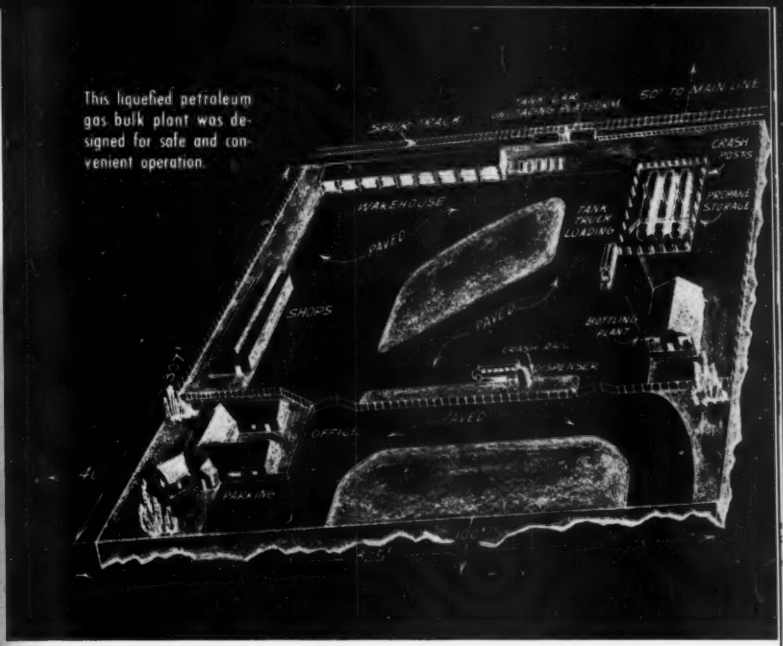
There is no organization engaged in the LP-Gas business too large or too small to have an effective safety program of its own. This subject is not controversial and is one that should be shared mutually by everyone from top management down. Employe cooperation is, of course, essential and should be inspired by providing an opportunity for them to participate in the development of the program.

What can be done about these human failures?

The question suggests that we learn what each man does. Each job should be analyzed by listing all the things the man must do, and then all the things the man must know. Each step should be checked for hazards that may be present in the work area, in the materials handled, and in the tools and equipment that are used. Job analysis is a good starting point for an effective safety program, and is one in which everyone can participate. It will help to reduce the element of human carelessness to a minimum.

We do not stress safety consciousness in the LP-Gas industry because we are unduly apprehensive of danger. We do stress safety, however, because we know that a man who does not perform his work safely is a hazard not only to himself but to others as well. If he is well trained and aware of the potential hazards in connection with his job and learns to respect them rather than to fear them, he becomes a safe worker and an asset to his company and the industry.


106,000 SMOKING AND MATCHES 17.5 %
70,000 ELECTRICAL— FIXED SERVICES 11.5 %
55,500 UNKNOWN 9.0 %
47,500 DEFECTIVE HEATING EQUIPMENT 7.8 %
31,000 LIGHTNING 6.1 %
31,000 DEFECTIVE FLUES 6.1 %
29,000 SPARKS ON ROOF 4.8 %
25,500 FLAMMABLE LIQUIDS 4.2 %
23,500 LAMPS, LANTERNS, STOVES 3.9 %
22,500 CHILDREN AND MATCHES 3.7 %
22,500 RUBBISH 3.7 %
MISCELLANEOUS
FIRE LOSS
DISTRIBUTION CHART
FOR 1946



This liquefied petroleum gas bulk plant was designed for safe and convenient operation.

BULK PLANTS

What makes them safe

THE bulk storage plant is the center of operations in the liquefied petroleum gas industry. More of the functions performed in handling butane and propane take place at the bulk plant than anywhere else in the flow of the fuel from its source to consumer. It is the home base of LP-Gas distribution.

For this reason, a presentation of safe methods in bulk plant functions and operations has been selected as the opening section of this safety issue.

The following material is divided into a description of plant facilities and a tabulation of operating procedures. The text on safe operation is subdivided into plant safe-

guards, tank car unloading, transport truck unloading, cylinder filling, delivery truck filling, and general maintenance. Illustrations are used wherever possible to augment the information presented.

The recommendations of NBFU Pamphlet No. 58 and the requirements of ICC regulations are weaved into the presentation as minimum standards for safe operation of bulk plants. Additional material, just as it does throughout the safety issue, summarizes good practice developed by LP-Gas men during years of experience with the fuel. One purpose of this presentation is to show what the industry has done to self-police itself.

BUILD SAFETY INTO THE PLANT

THE safeguards built into a bulk plant can be divided into two categories: Those required because of the inherent characteristics of the fuel and those involving location, extent and type of operation, with embellishments to suit the requirements of the individual operator.

The first safeguards are fundamental and are practically automatically included in any well engineered or well planned installation, and it is mandatory that they be incorporated in any plant handling LP-Gas to protect its personnel and the public. These needs are met by adherence to the NBFU Pamphlet No. 58 minimum requirements.

They are essentially the following:

1. That storage tanks be pressure vessels designed for a working pressure that is high enough to safely contain the LP-Gas at temperatures well above the normal atmospheric.

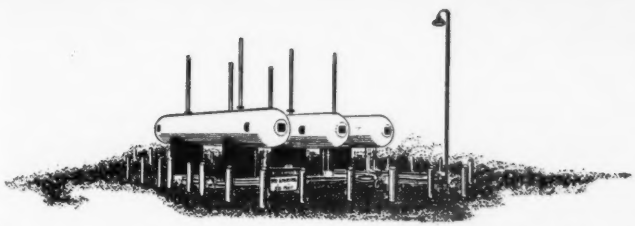
2. Storage tanks that are built and inspected according to the accepted API-ASME or ASME Codes, which guarantee the adequacy of design and quality of material and workmanship.

3. Storage tanks that are protected from excessive pressure by adequate relief valves, the size and capacity being determined from conservative formulas to insure the safeness of the tank under unusual outside exposures.

4. Tanks that are securely mounted on substantial fire-resisting foundations to prevent damage due to shifting or falling in case of earthquake or fire.

5. Tanks that are fitted with substantial valves and fittings designed for use with LP-Gas and are satisfactory for the pressures encountered.

6. Piping, fittings and valves of the minimum requirements and that are amply secure for the ordinary oper-



ating pressures, as well as being safe during severe outside exposures.

7. Piping, when possible, is located aboveground to facilitate inspection and to eliminate soil corrosion.

8. Hoses and hose fittings that are designed and built to withstand pressures greatly in excess of the normal operating pressures and are made of materials resistant to the solvent action of LP-Gas.

9. Excess flow valves or internal tank valves which reduce the human falibility factor materially in the event of escape of gas due to failures in hose or pipe.

10. Electrical apparatus and installations that are in accordance with the "National Electrical Code for Class 1, Group D Hazardous Locations" to reduce to a minimum the inherent hazards of ignition from electrical equipment of the ordinary type.

11. The conformance to minimum distances from property lines allowed for the location of tanks to provide safety from outside exposure during the normal operations in the plant.

12. Piping and hoses that are protected from increases in static pressure by the use of relief valves in the lines where needed.

13. The plain markings on gauging device which shows the maximum filling level in tanks or provision for a fixed outage connection from which the maximum filling level can be determined.

Other safeguards which may be incorporated in plants can vary with the size and character of the operation and which are in line with ordinary safety precautions used by handlers of any fuel product and are incorporated into the plant to protect it from accidents due to normal business operations.

Some of these features are:

1. Proper and adequate fencing to keep out undesirables.

2. Crash rails to prevent trucks and cars from injuring piping and equipment.

3. Car unloading rack to reduce hazard of slipping and falling when connecting and disconnecting hoses.

4. Hose racks to prevent wear and accidental damage to hoses.

5. Tank ladders and platforms with guard rails to reduce chances of falls and injury when opening and closing valves on tops of tanks.

6. Paved yard areas to reduce dirt accumulation and accidents due to ruts and puddles.

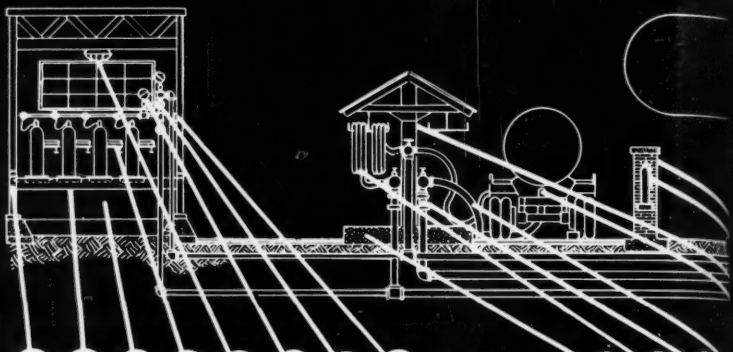
7. Adequate yard and plant area lighting to facilitate night operations and to add to protection.

8. Tool racks and work benches to facilitate good maintenance and repair.

9. Shelter house for truck loaders and unloaders so they are able to get out of the weather and still be close at hand during transfer operations.

10. Large yard area and room for orderly parking of equipment.

The next four pages show many safety features in bulk plants.



CYLINDER FILLING

1 VENTILATION provided at floor level to disperse fuel released when disconnecting cylinders.

2 PLATFORM at truck height to reduce lifting, dropping of cylinders.

3 SOLID FILL under cylinder filling platform to prevent gas pockets from forming.

4 SCALES for accurate, automatic weighing to prevent over-filling cylinders.

5 LIGHTING adequate from Class I, Group D, fixtures, and windows to prevent errors.

6 PRESSURE GAUGE to adjust by-pass to proper operating pressure.

7 BY-PASS VALVE to assure constant pressure at filling nozzles.

8 REMOTE CONTROL SWITCH for stopping pump motor quickly if necessary.

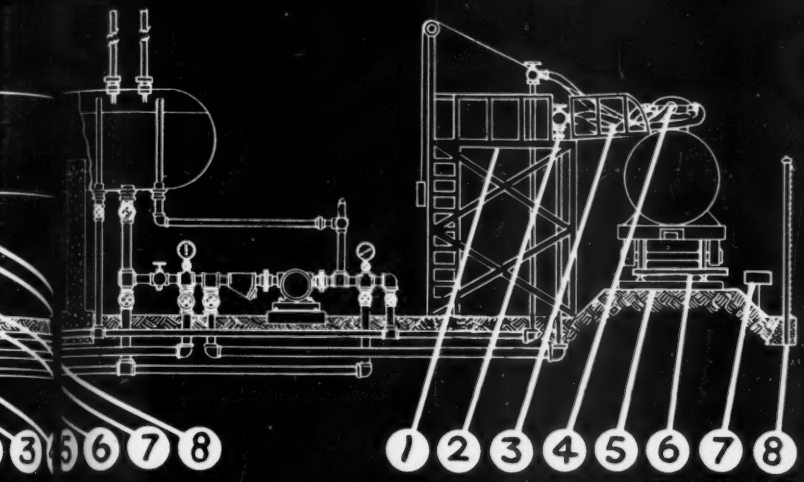
TRUCK UNLOADING

1 CONCR GUARD BLO prevent dam piping from tr

2 HOSE R to protect against mech damage.

3 CHECK V in unloading l prevent fuel fr caping in ca hose failure.

4 HOSE A COUPLINGS o proved design t duce chance of failure.



TANK CAR UNLOADING

UNLOADING PLATFORM elevated to reduce risk of operator slipping during operation. (1)

CHECK VALVE in liquid line to stop back flow in case of hose failure. (2)

PROPANE HOSES and couplings approved for high pressure. (3)

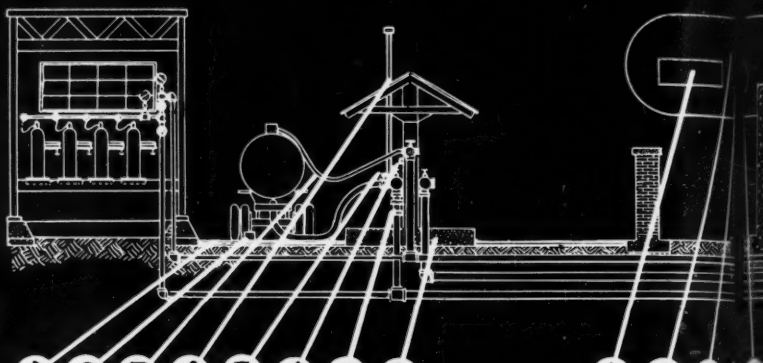
CHECK VALVES in tank car to stop flow from car in case of hose failure. (4)

SPUR located 50 ft. from main line to reduce outside exposure. (5)

WHEEL BLOCKS to prevent car from rolling during transfer operation. (6)

MEN WORKING SIGN to caution switch crew from connecting engine to tank car. (7)

FENCE to keep out trespassers. (8)



TRUCK FILLING

1 LOADING SPOT level and paved to insure correct gauge reading on truck.

2 WHEEL BLOCKS to prevent truck movement while hoses are connected.

3 VAPOR-RETURN HOSE to prevent excessive pressure in receiving tank.

4 HOSE VENT LINE to dissipate vapors at safe location.

5 HYDROSTATIC RELIEF VALVE on hose line to prevent excessive hose pressure.

6 REMOTE CONTROL SWITCH to enable truck driver to shut down loading operation instantly.

7 EXCESS FLOW CHECK VALVE in discharge line to protect against hose failure.

8 CONCRETE BLOCK to firmly support piping to reduce vibration, leaks and damage.

TANK INSTALLATIO

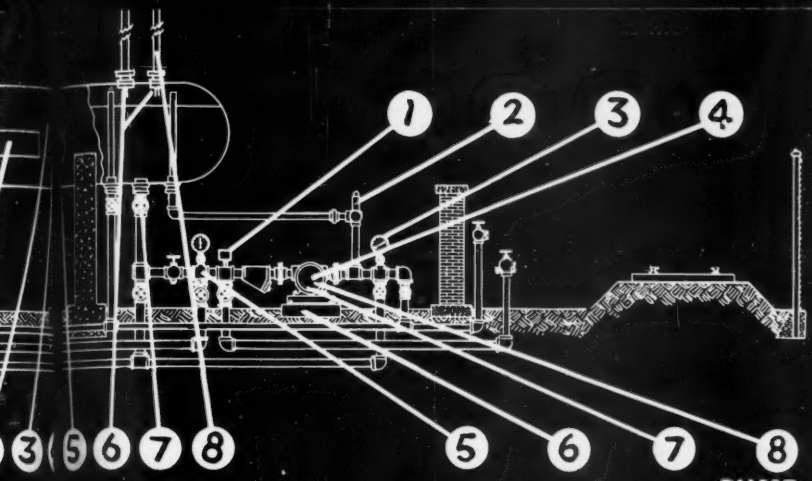
1 2 3 (5

1 NO SMO... FLAMMABLE ... to warn emp... and visitors a... carelessness.

2 LIGHT A... HEAT RESIST... PAINT job w... maintained to r... tank pressure.

3 CONCR... FOUNDATION ... signed for lo... prevent tank ... ment.

4 TANK c... built, listed ... labeled to insur... storage.



PUMP INSTALLATION

5 **GAUGING DE-** ...CE to indicate the ...ximum filling ...nt.

1 **HYDROSTATIC PRESSURE RELIEF VALVE** to prevent build-up in line pressure.

5 **VALVES AND FITTINGS** of approved design to prevent piping leaks.

6 **...FETY RELIEF ...LVE** set to take ...e of excessive ...ssure from heat or ...filling.

2 **BY-PASS** in discharge line to prevent overload and heating of pump and motor.

6 **PUMP** mounted on firm concrete base to support piping and to reduce vibration.

7 **...CESS FLOW ...LVE** in the tank ...let to stop flow in ...e of a broken line.

3 **PRESSURE GAUGE** in discharge line to warn of excess pressure or loss of suction.

7 **PUMP** designed and tested for LP-Gas to reduce gland leaks and maintenance.

8 **...FETY RELIEF** ...scharges 10 ft. ...ove tank to dissi... vapors.

4 **ELECTRIC MOTOR** of approved Class I, Group D, explosion-proof design and switches.

8 **SEPARATE PUMPS** and piping for butane and propane to prevent mixing of the products.

HOW TO UNLOAD TANK CARS

A SPECIFIC ROUTINE THAT HAS PROVED PRACTICAL AND SAFE

MOST liquefied petroleum gas operators located considerable distances from sources of supply receive their fuel in railroad tank cars built specially for transporting LP-Gases.

These cars are not unloaded like ordinary gasoline tank cars, but require a specific unloading routine.

The connecting up and unloading of tank cars is a routine operation in bulk plants where fuel is received by rail and many years of successful experience in these operations have taught the fact that safety and a rational unloading procedure go hand-in-hand.

The procedure breaks into three logical steps—operations preceding unloading, unloading, operations after unloading.

The steps in a good unloading procedure are outlined as follows:

BEFORE YOU START TO UNLOAD

1. After car is spotted, brakes are set and blocks placed against wheels, both back and front, to prevent car from moving.

2. Car is visually checked for leaks or other signs of bad order. If in serious bad order, shipper is notified at once for instructions as to handling.

3. "Tank car connected" signs are placed in location readily visible to train crews to prevent approach of switch engine or trains during unloading operation.

4. Ground wire is connected from end of pipeline to steel frame of car to prevent possibility of static release.

5. Check is made for open flames, rubbish fires, and any other source of ignition before connections are made to eliminate cause of ignition in case of escaping LP-Gas.

6. Plant storage is gauged to determine that sufficient space is available to receive the shipment to prevent overfilling of tanks.

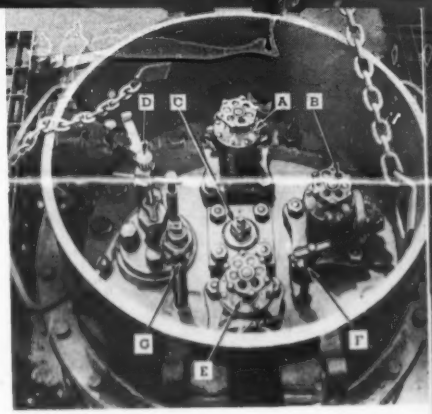
7. Plant operating schedule is planned to eliminate lost time and interference with unloading procedure.

8. Plant tank and line valves up to loading spot valves are set for receipt and lines and valves checked for leaks to prevent excessive losses and hazards during unloading.

9. Seal is broken, dome cover is lifted and all valves are tried to be sure they are closed to prevent LP-Gas from escaping when pipe plugs are removed from connections.

10. The thermometer well cap is removed and an armored thermometer

TANK CAR DOME



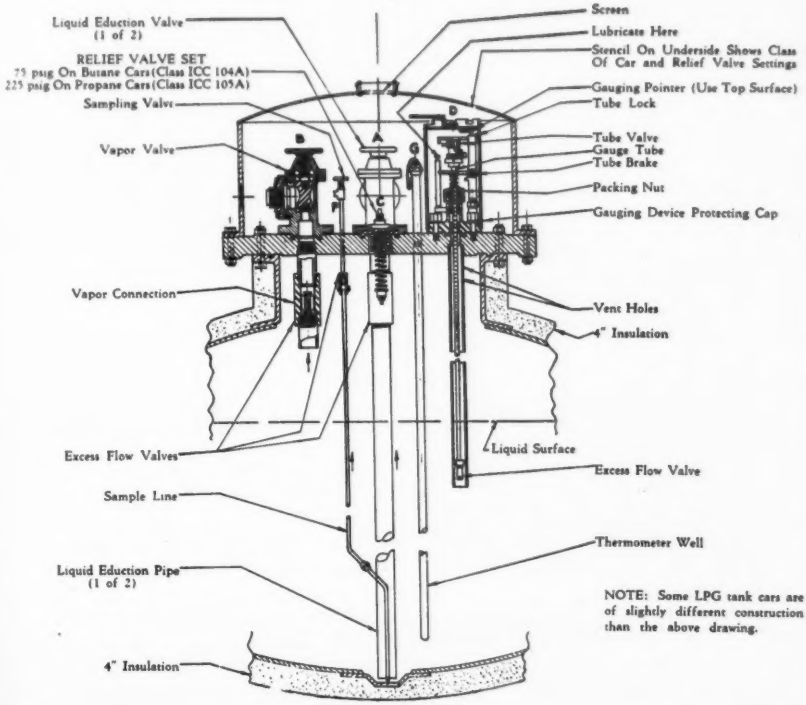
LEGEND

A — LIQUID EDUCTION VALVE
B — VAPOR VALVE
C — RELIEF VALVE
D — GAUGING DEVICE
E — LIQUID EDUCTION VALVE
F — SAMPLE VALVE
G — THERMOMETER WELL

INSTRUCTIONS FOR GAUGING

Depress Tube and unlock from Hold Down Device. If equipped with Gauge Tube Brake, depress Brake to raise Tube. Loosen Packing Nut slightly. If necessary, open Tube Valve sufficiently to permit slight flow of gas or liquid and adjust to liquid level. Read Outage indicated on Tube opposite top surface of Gauging Pointer.

After Gauging replace Tube Lock and Screw protecting Cover into place



NOTE: Some LPG tank cars are of slightly different construction than the above drawing.

lowered into well so temperature of shipment can be determined for accurate inventory control and later determination if any losses were incurred during unloading.

11. The gauging device protecting cap is unscrewed and placed inside the car dome to prevent loss or dropping on someone below.

12. The packing gland on the gauging device is checked and, if leaking, lubricant screw is turned down to stop leak; if this is not sufficient, gland nut is taken up slightly to prevent continued leakage of LP-Gas.

13. The tube lock is released, keeping in the clear to prevent being hit in the face in case slip tube comes up rapidly.

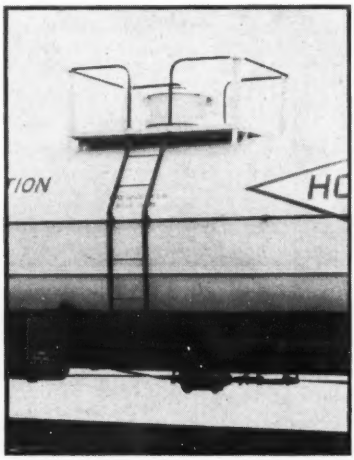
14. The slip tube brake is released, the tube pulled up about a foot and the tube valve is opened which will emit a small stream of liquid. Valve outlet should be pointed away from the face to prevent the fluid from impinging on the clothes or skin.

15. Slip tube is raised until liquid ceases to emit and is then lowered slowly until liquid again shows; then tube valve is closed and the marking of the tube at the gauging pointer is recorded. Operation is repeated until operator is sure of correctness of gauging, when the slip tube is pushed back to the bottom and locked in place to prevent damage to the tube due to bumping into it or from wind or other causes.

16. Pipe plugs are removed carefully from vapor valve and liquid eduction valves, allowing any pressure to dissipate before plug is entirely unsecured, to prevent hand injuries in case of a leaking car valve.

17. Vapor return and liquid unloading hoses are connected and tank car valves cracked open slowly to exert car pressure on the hoses. Connections, union connections and hoses are checked for leaks. If connections are not tight, car valves are closed and then connections are tightened or remade and operation is repeated until all connections are tight. Car valves are closed when working on hose or union connections. This is always good practice.

18. The thermometer is removed from the thermometer well, reading recorded, the thermometer well cap replaced, and the net gallons in shipment computed and checked with space in plant storage and bill of lading. Vapor pressure at 100°F. on bill of lading is checked to see that product is satisfactory for use in plant tanks to prevent transfer of a high vapor pressure material into tanks designed for a low vapor pressure material.



LP-Gas tank car dome with safety guard rail and ladder.

PLANT PUMP PROCEDURE

1. The liquid valve at the car unloading spot is cracked open and the line to pump suction is allowed to fill. Valve is only cracked slightly in order to prevent excess flow, causing excess flow valves in tank car to automatically close.

2. The flow of liquid to pump is checked by venting pump and when pump is primed, unloading rack valve is slowly opened to wide-open position to allow for unrestricted flow to pump.

3. The pump is started and flow controlled by throttling discharge valve to prevent transfer rate faster than excess flow valves on tank car will allow. This precaution prevents excess flow valves from closing, which might cause damage to pump from running dry.

4. After pump is running, vapor valve at car unloading rack is cracked open and plant and car pressure allowed to equalize to prevent excessive pressure on receiving tanks.

5. After the flow of liquid has been established, operator continues to check by eye and ear to see that operation continues satisfactorily and that no leaks or untoward incidents occur, and remains nearby in readiness to shut down operations if and when needed for any reason. Constant vigilance permits coping with the unexpected, which increases the overall safety of operations.

6. During unloading operations, operator checks receiving tank gauges and pressures and tank car gauge at regular intervals to determine progress of unloading so as to prevent mechanical injury to pump in case of loss of suction and to prevent overfilling or overpressuring of receiving tanks.

7. When the tank car is empty, which is determined by the tank car gauge, the pump is shut off and all plant valves and car valves are closed, receiving tanks are gauged, and losses, if any, determined. If losses are unusual, underground lines and other points where leaks could occur without being easily noticeable should be checked to prevent future losses and hazards from leakage.

8. The outlined procedure for disconnecting tank cars is followed.

THE COMPRESSOR METHOD

1. Liquid valve at car unloading rack is opened slowly, interconnecting liquid from tank car to receiving tank.

2. Vapor valve at tank car unloading rack is cracked open slowly to allow vapors to compressor discharge.

3. Compressor is started with discharge to tank car and suction from receiving tank to lower necessary tank pressure and increase pressure on tank car to cause flow of liquid from car to tank.

4. Do not let tank car pressure get high enough to open relief valve. Check to see that liquid is flowing.

5. When tank car is empty, the liquid line and car valves are closed. The suction from the compressor is connected to the tank car and the discharge to the receiving tank by

switching the multiport valve on the compressor piping setup. The compressor is allowed to run until the pressure on the tank car is reduced to 15 to 20 psig to remove the remaining vapors from the tank car.

6. When this pressure is reached, the compressor is shut down, all valves are closed and the outlined procedure for disconnecting tank car is followed.

WHEN YOU DISCONNECT . . . SIX POINTS TO WATCH

1. The bleed valve on the liquid is opened, allowing the remaining liquid in the hose to dissipate to the atmosphere from a point high enough that it will dissipate in the air to prevent the accumulation of concentrations of vapor or liquid near the ground.

2. The union connection or hose bleed valve in the vapor line at the tank car is cracked, allowing vapors to escape to the air to reduce the pressure on the vapor line.

3. Vapor and liquid hoses are disconnected, outlets capped, and the hoses hung on hose racks to preserve the hose and to prevent any LP-Gas from escaping to the atmosphere between unloading periods.

4. The outlet plugs are replaced in the tank car liquid and vapor valves and the gauging devices protecting cap is replaced to put car in order for movement over the railroad.

5. Dome cover is replaced and fastened, access platform is pulled into the clear, wheel blocks and unloading signs are removed and stored away for next time's use, and flammable placards are reversed to indicate an empty car.

6. Operator makes a circuit of car to see that all operations have been completed and car is free for movement. He then notifies railroad that car is empty and supplies return billing instructions to assure quick pick-up and return.

Tank car in unloading position with properly placed warning sign.

UNLOADING TRANSPORT TRUCKS

IT'S THE DRIVER'S RESPONSIBILITY

MANY plants receive their supply of LP-Gas by delivery from highway transport trucks. In some areas these trucks are operated by transportation contractors under State or ICC regulations as carriers; in other areas they may be operated by the wholesale distributors of the fuel, and in some instances by the bulk plant operator, himself.

Some of these trucks are equipped with unloading pumps and others depend upon the plant unloading facilities.

This type of transportation differs from rail delivery inasmuch as the truck driver is on hand when the load is being transferred, while the railroad crew's responsibility ceases when the car is spotted.

In some cases, the responsibility of the complete transfer is upon the truck driver and in other instances the responsibility lies with the plant man, but in all cases of interstate transport, it is necessary for a truck driver to be present when unloading flammable liquids such as gasoline and LP-Gas.

Regardless of the responsibility for unloading, there are certain practices that, if followed, will help to insure safety and dispatch in handling these incoming cargoes.

The following procedure is recommended:

WHAT TO CHECK BEFORE UNLOADING

1. The driver spots his truck at the unloading point, sets his brakes and shuts off his engine to eliminate source of ignition during the time hose connections are being made.

2. Driver sets chocks front and back of rear wheels to prevent movement of truck after lines have been connected.

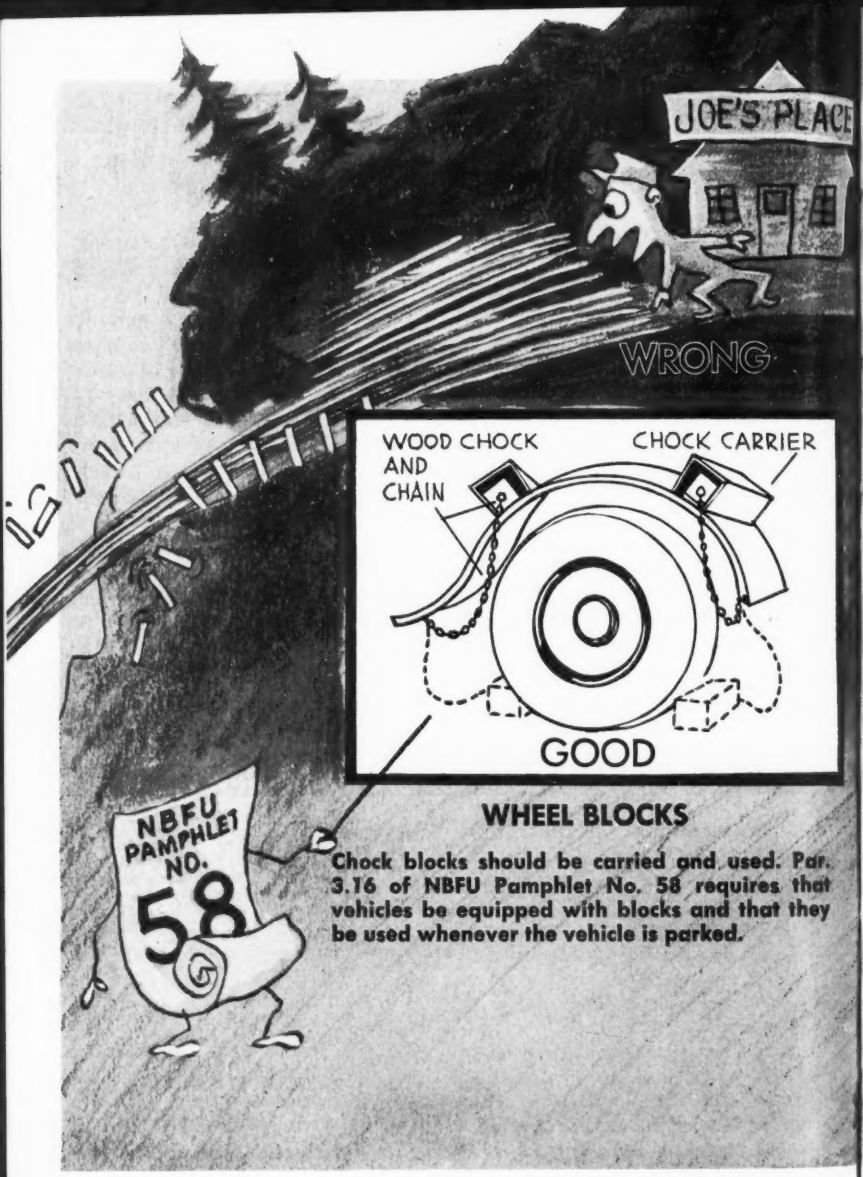
3. Definite instruction are given as to the relative duties of plant man and driver to prevent lack of attention to details of unloading due to divided responsibility.

4. Plant gate is closed and locked to prevent customers and employes from driving into plant while hose connections are being made.

5. Ground wire is connected from the steel frame or tank on both truck and trailer to plant piping to eliminate hazards from static sparks.

6. Check is made for open flames, rubbish fires and any other source of ignition before hose connections are made to eliminate cause of ignition in case of escaping LP-Gas.

7. Plant storage is gauged to de-



WHEEL BLOCKS

Chock blocks should be carried and used. Par. 3.16 of NBFU Pamphlet No. 58 requires that vehicles be equipped with blocks and that they be used whenever the vehicle is parked.

termine that sufficient space is available to receive the shipment to prevent overfilling of tanks.

8. Plant operating schedule is planned to eliminate lost time and interference with unloading procedure.

9. Plant line and tank valves up to unloading spot are set for receipt and lines and valves checked for leaks to prevent excessive losses and hazards during unloading.

10. Individual tanks on truck and trailer are gauged to check amount of load, and gauge devices are closed at once to prevent escape of gas to atmosphere.

11. Bill of lading is checked to see that product has a vapor pressure suitable for storage in the receiving tanks.

12. Liquid and vapor valves on truck tanks are checked to see they are in closed position to prevent escape of gas when pipe plugs are removed as valves may have vibrated open during trip.

13. Pipe caps are removed carefully from liquid and vapor connections on the vehicle to allow escape of gas that may have leaked past valves during trip.

14. Liquid and vapor hoses are connected to the truck and the plant intake valves.

15. After hoses are connected, the valves on the vehicle tanks are opened slowly to allow pressure on the hoses. If any leaks show, the valves are closed and the connections tightened up or remade, if necessary, and test is repeated until all connections are tight.

16. If truck is equipped with pump, close check is made at this time for packing gland leakage at the pump and, if necessary, pump is lubricated or packing taken up slightly to stop leakage.

PLANT PUMP PROCEDURE

1. If plant pump or compressor is available, truck pump is bypassed and plant facilities are used, as this eliminates the need of operating the truck engine during fuel transfer.

2. Liquid intake valve to plant is cracked slowly to prevent excess flow valves on transport from closing.

3. Flow of liquid to the pump is checked by venting pump and when pump is primed, plant intake valve is slowly opened to allow unrestricted flow of liquid to the pump.

4. The pump is started and flow controlled by throttling of discharge valve to prevent transfer rate faster than excess flow valves on transport tank will allow. This prevents excess flow valves from closing, which might cause damage to pump by running dry.

5. After pump is running, vapor valve at plant intake is cracked open slowly and transport pressure allowed to equalize with receiving tank to prevent excessive pressure on receiving tanks.

6. After flow of liquid has been established, operator continues to check by ear and eye to see that operation continues satisfactorily. When there are both truck driver and plant operator present, one should have complete control over all operations to prevent

confusion should quick attention be needed.

7. During unloading operations, operator checks receiving tank gauges and pressure and truck gauges at regular intervals to determine progress of unloading to prevent mechanical injury to pump in case of loss of suction and to prevent overfilling or over-pressuring of receiving tanks.

8. When transport tanks are empty, the pump is shut off and all plant valves and truck valves are closed; receiving tanks are gauged and losses, if any, determined. If losses are unusual, underground lines and other points where leaks could occur without being easily noticeable should be checked to prevent future losses and hazards from leakage.

TRUCK PUMP OPERATION

The same procedure is used to unload when using the pump on the truck with the following exceptions:

1. When the liquid hose has been connected and tested, the plant intake valve is opened slowly, allowing free passage from the truck to the tank. This is done to prevent excess pressure on the discharge hose when pump is started.

2. After all connections are made and found tight and plant valve is opened, truck motor is started and power take-off engaged to allow pump to rotate. Engine speed is set to allow for proper pumping speed and truck driver stands by his unit until unloading is completed, to be available in case someone in plant might close a valve against the truck pump, at which time he stops pumping to prevent excess pressure on the discharge hose.

3. After discharge has been completed, driver disengages power take-off and then shuts down truck engine before any hoses are disconnected to eliminate source of ignition when hoses are vented.

4. Usually when there are multiple tanks on a transport, one will empty first. At this time, the liquid and vapor valves are closed on this tank. As the next tank becomes empty, its valves are shut off, and so on until all tanks are emptied. This is done to prevent vapor locking the pump which may happen from drawing on an empty tank.

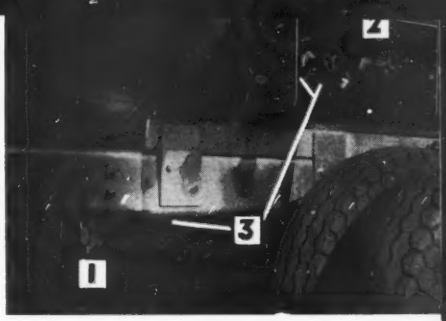
THE COMPRESSOR METHOD

1. Liquid line at plant intake is opened slowly, interconnecting liquid from transport to receiving tanks.

2. Vapor valve at plant intake is opened to allow vapors to compressor suction.

3. Compressor is started with discharge to transport tanks and suction

FILLING CONNECTIONS



1. Liquid outlet in protected location.
2. Vapor return and bypass valves protected from roll-over and collision by location and guard.
3. All outlets protected by excess flow valves.

from receiving tanks to lower receiving tank pressure and increase pressure on transport tanks. This causes flow of liquid from truck to plant tanks.

4. The same vigilance in observation is performed as when a pump is used for the transfer.

5. When the transport tanks are empty the liquid line and liquid valves on the transport are closed. The suction from the compressor is connected to the tank truck and the discharge to the receiving tank by switching the multiport valve on the compressor piping setup. The compressor is allowed to run until the pressure on the transport is reduced to 15 to 20 psig to remove the residual vapors from the transport tanks.

WHEN YOU DISCONNECT . . . NINE POINTS TO WATCH

1. Before disconnecting hoses, a quick check is made to see that the truck loading and tank valves are closed.

2. Vapor hose is disconnected slowly, allowing pressure to dissipate before connections are broken completely to reduce hazard in handling the hose.

3. The liquid hose is vented through either the plant or truck bleed line to reduce the pressure on the hose and dissipate as much as possible of the liquid to the air.

4. After the pressure is off the hose, it is disconnected from the truck and the remaining liquid, if any, is carefully spread on the ground so it will evaporate.

5. All truck tank outlet connections are capped to put vehicle into proper shape to travel the highway.

6. Hoses are capped and placed in hose racks to prevent wear and damage.

7. Plant operator and truck driver make a tour completely around the vehicle, check openings, remove wheel blocks and driver makes check of tires and running gear to make sure outfit is OK for return trip.

8. Plant man, after checking atmosphere, gives truck driver OK to start engine and proceed on return trip.

9. Plant is secured, gates locked and gauges and reports turned in to office to advise management of status of plant and inventory.

HOW TO FILL TANK TRUCKS

THE fuel going out of a bulk plant is loaded into the delivery tank trucks for final delivery to the user.

This operation is repeated many times a month and familiarity with the operation has resulted in an infrequency of accidents.

A way to keep safe is to line up the normal operations in such manner that they automatically provide safety in handling. The following procedure is suggested:

1. Truck is spotted at the same place at the loading dock each time so hoses can be easily connected.

2. Truck engine is shut off before driver leaves the cab to eliminate source of possible ignition.

3. Brakes are set and wheels are chocked to prevent truck rolling, causing strain on hose connections and piping.

4. Before connecting hoses, driver makes a quick check of truck and plant for any unusual conditions so as to prevent the loading of truck interfering with previous set operations, such as car unloading or bottle filling.

5. After liquid and vapor hoses are connected, valves on truck are opened slowly to allow pressure on hoses and connections, which are checked for leaks before opening plant valves. If leaks are found, valves are closed and leaks stopped and test repeated.

6. Plant valves are opened and liquid transfer started. The driver or plant man stands by during transfer operation to be on hand to take care of any situation that might arise. Valves are to be opened wide to permit excess flow valves to function.

7. During loading operation, driver checks tank level at regular intervals to check rate of loading.

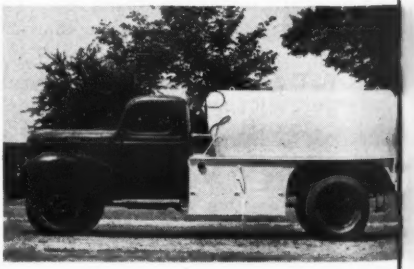
8. When tank nears capacity point, driver checks for level with fixed capacity outage valve, standing by until liquid shows to prevent overfilling.

9. After pump is shut down and valves closed, tank truck is given final gauge and, if overloaded, excess is returned to plant to allow proper vapor space above the load for expansion of the liquid.

10. After filling, hoses are disconnected at once and stowed on racks to prevent damage to hose and to prevent possibility of the truck being moved with hoses still connected.

11. Before getting into truck, driver walks completely around truck, making quick check of condition of running gear, hose storage, truck piping, valves and conditions at loading rack to insure that truck is safe for the road and plant is secure.

12. Wheel chocks are removed and placed in racks so they will be available at next stop.



Bulk delivery truck with piping and outlets guarded.

CYLINDERS—THERE'S A RIGHT WAY TO FILL THEM

CYLINDER filling operations are carried on in plants especially designed for this purpose.

From the experience gained in handling many millions of cylinders, definite standards of operations have been developed that make the filling and handling of cylinders one of the safest operations in the industry.

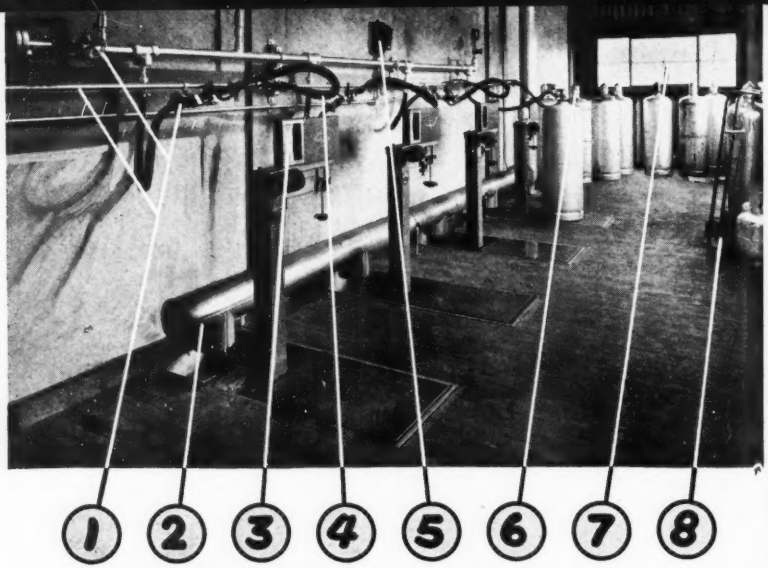
Although the smaller operator may not have the need of the elaborate facilities the larger companies use, it is essential that the cylinder filling installation that he makes and the procedure carried out be modeled after the successful experience of the older operators to insure the continuity of this good safety record.

Some of the main points of this operation are discussed below with the reasons for following them:

1. Cylinder filling can be done in the open but in climates where it is necessary to use a building, good ventilation is provided particularly at the floor level, as the operation of making and breaking the hose connections releases a small amount of gas each time and provision must be made to prevent its accumulation.

2. Filling floors are tight and preferably on a solid fill to prevent gas accumulation under the platform or building.

3. Only approved cylinders with ap-



FILLING PLANT

1. Approved piping, fittings and hoses to eliminate leaks.
2. Floor level ventilation to prevent accumulation of discharged vapor.
3. Accurate scales with close precision scale to assure correct filling of cylinders.
4. Return line to top of overfilled cylinders to prevent escape of vapors.
5. Vapor proof electric switches and fixtures to prevent ignition from electrical sparks.
6. Cylinder valves protected by caps to prevent damage in handling.
7. Large window for good lighting to help easy reading of scale and stampings on cylinders.
8. Hand truck to handle cylinders to increase safety in operation.

proved and proper fittings are filled to prevent accidents in handling and use.

4. Before filling, cylinders are checked for damage in transit and any cylinder visibly in bad order is withdrawn from service. Such cylinders may be reconditioned and returned to service under conditions set out by the regulatory authority that has jurisdiction.

5. Before any cylinder is filled, it is checked to see that it is fitted with relief valve or fuse plugs to prevent bursting, should it be in a fire later.

6. Before filling, weighing scale is set to adjust for tare weight of the cylinder, because weights of individual cylinders vary.

7. Scales are checked regularly for accuracy to insure correct measurement.

8. To prevent overfilling, the filling operation is stopped manually or automatically when the predetermined amount of fuel is in the cylinder.

9. Cylinders are not filled full but only to the allowed limit as prescribed in Par. B11—NBFU Pamphlet No. 58, to allow room for expansion of the liquid with change in temperature.

10. After filling hose has been disconnected, charged cylinder weight is checked to prevent false weights due to weight of hose and hose valve, causing error.

11. Overfilled cylinders are vented down to correct weight through a vent line discharging in a safe place to prevent undue accumulation of gas in filling room.

12. After filling, cylinders are checked for valve and thread leaks to prevent loss and hazards in shipment.

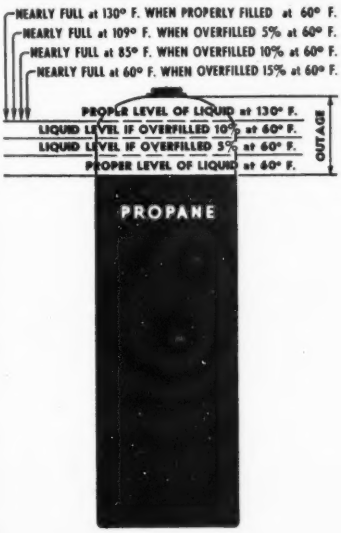
13. After cylinders have been checked, valve protection cap is screwed on hand-tight to prevent damage to valve when cylinders are in transit.

14. Contents of leaky or damaged cylinders are removed by venting into a vacuum return line or to atmosphere in a safe place.

15. Filled cylinders are stored neatly in a vertical position to facilitate handling and to prevent accidents due to rolling.

CYLINDER CHART

ILLUSTRATING THE IMPORTANCE OF PROPER FILLING TO I.C.C. REGULATIONS


NEARLY FULL at 130° F. WHEN PROPERLY FILLED at 60° F.
NEARLY FULL at 109° F. WHEN OVERFILLED 5% at 60° F.
NEARLY FULL at 85° F. WHEN OVERFILLED 10% at 60° F.
NEARLY FULL at 60° F. WHEN OVERFILLED 15% at 60° F.
PROPER LEVEL OF LIQUID at 130° F.
LIQUID LEVEL IF OVERFILLED 10% at 60° F.
LIQUID LEVEL IF OVERFILLED 5% at 60° F.
PROPER LEVEL OF LIQUID at 60° F.
OUTAGE
PROPANE

THE CYLINDER RETEST

TO protect the carriers handling LP-Gas in cylinders and to protect other freight, the ICC has established definite rules and regulations for the test and maintenance of cylinders used in transit.

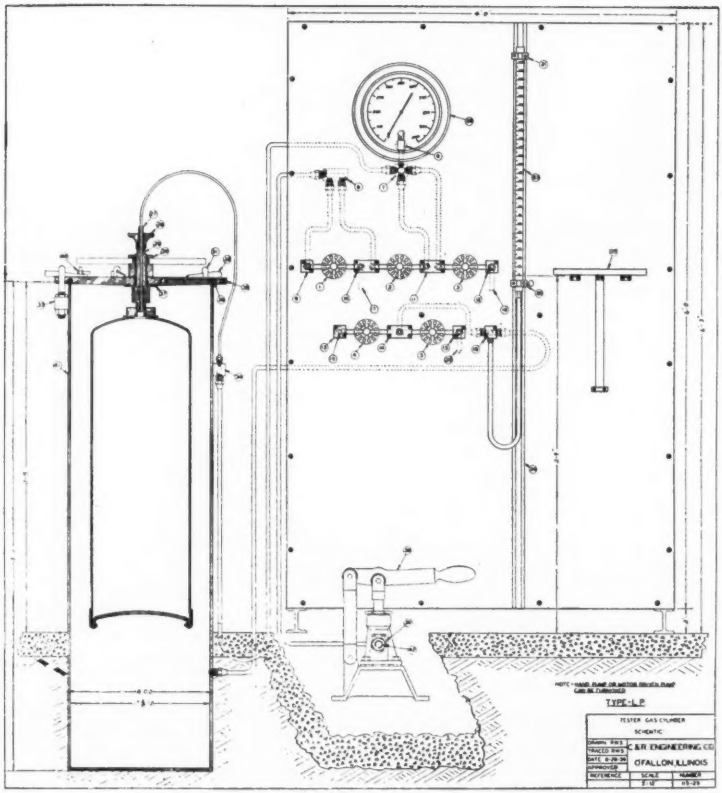
This procedure is set forth in detail in Agent H. A. Campbell's Freight Tariff No. 4 publishing ICC regulations for transportation of explosives and other dangerous articles, including specifications for shipping containers.

Owners of large numbers of cylinders have testing equipment and subject their cylinders to test at regular periods.

The smaller operator may not be justified in the installation of the necessary testing equipment, but this does not eliminate the need of the test or prevent the necessary tests being made, as there are custom testing plants that will take care of this work for a fair charge and will re-mark the cylinders after testing.

'1. Cylinders are tested tc comply

APPARATUS FOR TESTING CYLINDERS



PARTS LIST

1 Pump By Pass Valve—Walworth ¼ — 225 P
2 Pressure Control Valve—Walworth ¼ — 225 P
3 Pressure Release Valve—Walworth ¼"—225 P
4 Jacket Water Inlet Valve—Walworth ¼ — 225 P
5 Jacket Water Leveling Valve—Walworth ¼"—225 P
6 Gauge Suppressing Valve—Pratt and Cady ¼"—1050
7 Junction Block
8 Junction Block
9 Junction Block
10 Junction Block
11 Junction Block
12 Junction Block
13 Junction Block
14 Junction Block
15 Junction Block
16 Junction Block
17 Pump By-Pass Drain Line
18 Cylinder Pressure Release Drain Line
19 Jacket Water Inlet Line
20 Jacket Water Leveling Drain
21 Sliding Burette Clamp
22 Sliding Burette Clamp with Lock
23 Adjustable Burette
24 Adjustable Burette Slide Bar
25 Desk
26 Pressure Gauge — Consolidated 1079 A — 9" Dura Gauge
27 Cylinder Nipple
28 Wing Nut
29 Jacket Sealing Plug
30 Lock Nut
31 Wedge Holder
32 Wedge
33 Wedge Holder Block
34 Tubing Support Block
35 Jacket Head
36 Jacket Head Gasket
37 Jacket Sealing Plug Gasket
38 Hydrostatic Pump (Hand)
39 Horizontal Check Valve—Vogt ⅜"—3492
40 Lever Handle Air Cock ¼"
41 Water Jacket
42 City Water Inlet Line

with ICC regulations in order to detect and remove from service any cylinder that is not considered to be a safe shipping container; this practice has the tendency also to promote and retain public confidence in the industry.

2. Any cylinder used more than once and reshipped, must be in such condition that it will protect its contents as efficiently as a new container.

3. Cylinders that are dented, or show evidence of rough usage or bad corrosion, are not recharged or reshipped until after a prescribed form of test to prevent causes of damage to carriers and property in transit.

4. Cylinders may be tested by the water jacket expansion test or the modified expansion test to determine their fitness for use.

5. In the water jacket expansion test, the cylinder is subjected to a hydrostatic test of 2 times the service pressure marked on the cylinder for a period of 30 seconds or longer. During the test, the cylinder is immersed in liquid and the total exansion recorded by the displacement of the liquid. After the pressure is released, the permanent expansion is determined by measurement of the amount of liquid necessary to balance the leveling burrette. If the permanent expansion exceeds 10% of the total expansion of the cylinder, or any leaks develop, the cylinder must be condemned.

6. When the water jacket expansion test is used, cylinders are subjected to test on 10-year intervals provided they pass visual inspection on each filling.

7. In the modified expansion test, the cylinder is subjected to a hydrostatic test of 2 times the service pressure and carefully examined for leaks or other signs of damage or deterioration, but without the need of determining the expansion.

8. When the modified test is used, cylinders are subjected to retest every 5 years after the initial 10-year period.

9. Tanks may be tested with paint thinner, or a light kerosene, instead of water, to prevent operating troubles due to the presence of moisture.

10. After testing, cylinders are closed and the test date (month and year) stamped into the metal of the head of the cylinder, but dates of previous tests are not removed so the age of the container is always evident from the marking.

11. Records of the tests are kept, giving the date and result of the test and disposition of cylinders failing to pass so as to prevent use of faulty cylinders in the LP-Gas industry.

CYLINDER MARKINGS

1. ICC 4B, followed by service pressure for which it is intended, as ICC 4B 240.
2. Tare weight.
3. Serial number.
4. Inspector's official mark.
5. Dates of tests.
6. Name, mark or initials of company or person for whom cylinder is made.

CLEAN PLANTS PAY

GOOD MAINTENANCE PROMOTES SAFETY

THE general maintenance of a plant is an important factor in the safety of all operations.

A well maintained plant encourages an interest in the operations by owners and operators, alike, and a real interest in safe operations automatically results in good safety habits.

Good operators practice a routine of plant maintenance and provide the facilities and time to attend to maintenance.

The following routine of maintenance will help to prevent accidents:

1. The plant is kept clean at all times by removing weeds, rags, tools, and scattered materials because a policy of cleanliness and orderliness in the plant instills confidence in both employes and the public.

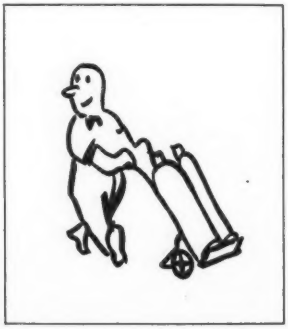
2. A good tool kit is kept on hand, including the necessary hand tools and work-aiding devices, as good tools help to make good workmen.

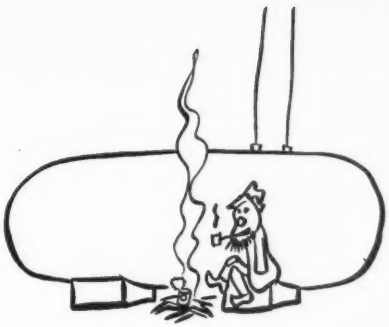
3. Damaged tools are repaired or destroyed as the use of damaged or worn-out tools causes accidents.

4. Fences are kept in good repair and gates kept locked to prevent entrance by unauthorized persons and children.

5. Owners and employes make a visual check of plant and equipment on every occasion they have to be at the plant, which keeps them acquainted with the operation being performed and reduces the chances of interference with an operation already started.

6. A systematic check is made daily of condition of valves, piping, pumps and other equipment, looking for evident leaks or potential trouble, and anything out of order is taken care





of at once to prevent need of emergency repairs.

7. Rubbish, old crates, and other flammable materials, are stacked in one place in the clear and are removed from the premises at regular intervals, to prevent rubbish fires and accidents due to nails in boards.

8. Idle trucks and equipment are parked in the clear to prevent collisions and accidents when backing and turning trucks.

9. Daily inventories of LP-Gas product is taken and recorded to check against leaks with consequent loss of product and creation of possible hazardous conditions.

10. Pumps, motors, and compressors are kept lubricated and packing glands are maintained in good order to prevent freeze-ups and burnt-out motors, with consequent electrical hazards.

11. Routine check is made of electrical fixtures, fittings and fuse boxes to prevent possibility of source of ignition due to faulty or improper electrical equipment.

12. Hoses, hose couplings and hose connectors are checked regularly for signs of damage or weakness and replaced or repaired before they may become a cause of release of LP-Gas.

13. When repairs or changes are made in piping involving cutting into lines, piping is disconnected and purged and removed to an open area to prevent flash fires.

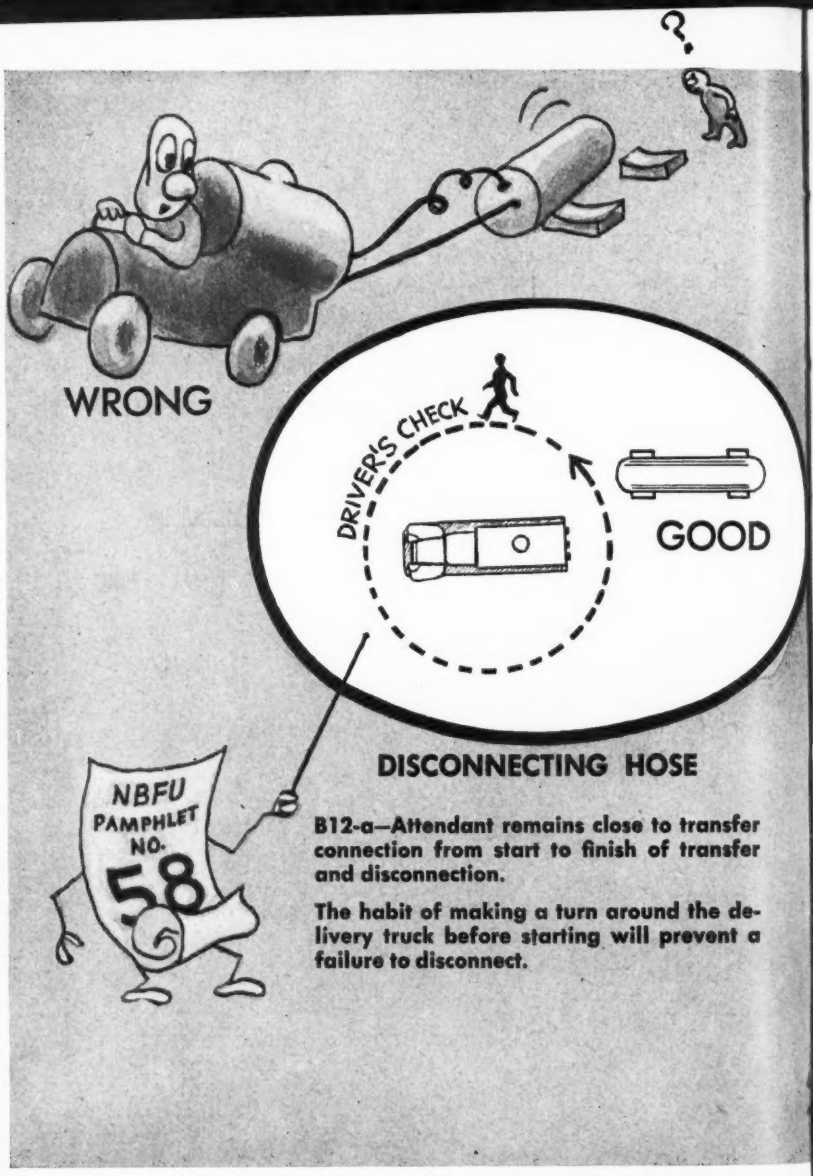
14. When making major repairs to plant or piping, all live connections are plugged or blinded to prevent escape of fuel due to opening of valves.

15. Fire extinguishers are checked either by plant personnel or a testing firm at regular intervals to make sure they are in proper working order in case they are needed.

16. Yard area and driveways are kept free of ruts and holes to prevent accidents.

17. Customer tanks not in use are stored in clear area with valves kept closed to prevent damage to tanks.

18. Hand trucks and tank handling equipment are provided and kept in good repair to reduce accidents due to handling appliances and tanks.



DISCONNECTING HOSE

B12-a—Attendant remains close to transfer connection from start to finish of transfer and disconnection.

The habit of making a turn around the delivery truck before starting will prevent a failure to disconnect.

FUEL DELIVERY

Good methods bring new customers and hold the old ones

THE REASON there is an LP-Gas industry is its ability to make available the conveniences and economies of gas fuel to the suburban and rural population and industry.

This is done by the industry's transportation and delivery system which is the keystone of its strength. It must be flexible and safe, and the equipment is called upon to reach to the most remote points beyond paved highways.

The driver, with his delivery truck, is the direct contact between the plant operator and his customers. The truck is a portable plant combining the task of transportation with that of a liquid transfer problem at every stop.

The equipment must be sturdy to cope with the off-highway situations.

The tanks, piping, and pumping unit must be designed and maintained to safely handle and transfer the liquid under the normal working pressures encountered.

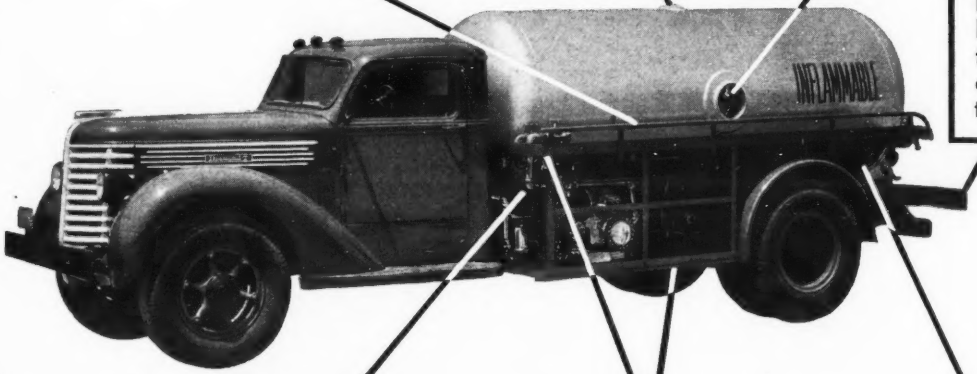
The units must be built to withstand the inevitable highway accidents without causing an undue hazard to the driver or the public due to escaping fuel.

Delivery is regulated by Specification MC 320 of Part VII of the ICC Motor Carrier Safety Regulations.

Safe operation of the delivery truck can be divided into two main categories—the methods to prevent accidents that are incidental to normal highway operations and the methods to prevent accidents that might be caused by the transportation and handling of LP-Gas.

Much has been written on the first phase of this problem, as the truck transportation industry is a wide one, and a condensation of the important facts gained from this past experience is presented later.

The immediate problems of safe handling brought about by the physical characteristics of the fuel we handle are less widely known to the public and to some of the newer operators in the field. Safe methods and practices proven by experience are offered as suggestions to help keep the safety record of the industry at the high point it deserves.



Pipe rail to retain hose on rack.

Safety valve well protected.

Rotary gauge and maximum fill valves recessed for protection.

Heavy bumper to prevent damage to tank.

All pipe and fittings heavy steel construction with ample road clearance and protection.

Heavy steel running board to protect meter, pump, valves and piping.

Heavy welded tank supports and reinforcing pads.

SAFETY IS BUILT INTO THE TANK TRUCK

1. The chassis is selected with sufficient power and weight to safely handle the imposed load in order to prevent it being a slow-moving highway menace and to enable it to get to the remote points of delivery safely.

2. The tank is of code design and construction to handle safely the LP-Gas under all atmospheric temperatures.

3. The tank is mounted securely to the vehicle and reinforcing pads are welded to the tank at the points where additional strains, due to stopping, starting or traveling rough roads, is transmitted to the tank shell. This prevents over-stressing of the tank shell at local points.

4. Tank mounting, piping and tank connections are designed to provide for overturning or collision without causing undue damage or escape of gas.

5. Safety valve outlets located in the top of the tank are protected by being set in a recess, or with a heavy guard, to be able to take the weight of the tank and vehicle without injury in case of a roll-over, thus preventing leakage of fuel in such an accident.

6. The liquid outlet is protected by an internal tank valve to prevent loss of cargo in case of an accident that might rupture the valves or piping.

7. All other tank outlets are protected by internal valves or small bore (54 drill max.) restrictions to prevent loss of contents in case of accident.

8. Tank and piping are protected from collision damage by heavy bumpers, or guards, located to care for end-on or side-swipe collisions to reduce the hazard of ruptured piping and possible escape of LP-Gas.

9. Provision is made for storing the hoses either on reels or in racks to prevent damage to hose.

10. Muffler and exhaust pipe are located away from pump packing glands or hose connecting and disconnecting locations to reduce chance of ignition of any small amounts of gas that might be freed to the atmosphere.

FILLING CONSUMER TANKS . . .

IT MUST BE DONE RIGHT

FILLING the consumer tank is the operation where the driver is in direct contact with the customer and the place where his safe standards of operation are observed by the user and the public.

Public confidence in the safeness of the use and handling of LP-Gas is needed by the industry to overcome propaganda put out by competitive sources of energy, and spectacular, many times, unwarranted press releases.

The delivery truck man is in a position, by his experience and familiarity with the product, to improve the industry's standing, and operators who desire to raise the standards of the industry make it mandatory that their truck driver

salesmen conform to standard practices and are qualified to answer questions asked by the public about safe handling and use of LP-Gas.

There are operators who have made millions of deliveries without a serious filling accident. Operations of this type are the goal of the industry as a whole.

The highlights of a good procedure follow:

1. Truck is parked in a location within easy hose reach of the tank, motor is shut off and wheel blocks set in place to make vehicle secure.

2. Driver makes quick, visual check of immediate surroundings for rubbish fires or other unusual situations, and if not in order, starting of delivery is delayed until operation is made safe from unusual source of ignition.

3. Driver checks consumer tank gauge to estimate approximate delivery. If tank is found empty, outlet valve on tank is closed to prevent gas going into house piping before check is made as to open burners on appliances.

4. Liquid and vapor return hose connections are made to tank, and hose valves opened slowly to prevent excess flow valve from closing.

5. Connections are checked for tightness and if any leaks are evident, hose valves are closed and connections tightened, or remade, to prevent leakage of fuel at tank.

6. When connections are secure at customer tank, driver returns to truck, opens liquid and vapor return valves on truck slowly, starts motor, engages power take-off to start pump, regulates engine speed for proper pumping rate, and returns to customer tank to watch gauge to prevent overfilling.

7. When gauge indicates that level for filling is being approached, driver starts to top off tank by gradually pinching down on valve on hose and shuts valve completely when level is reached, closes vapor return valve, returns to truck and shuts off pump and motor, then shuts off vapor and liquid valves at truck to relieve hose of pumping pressure.

8. Driver returns to customer tank and opens bleeder valve between hose valve and tank connection before disconnecting hose coupling to check for leak in hose valve or tank valve.

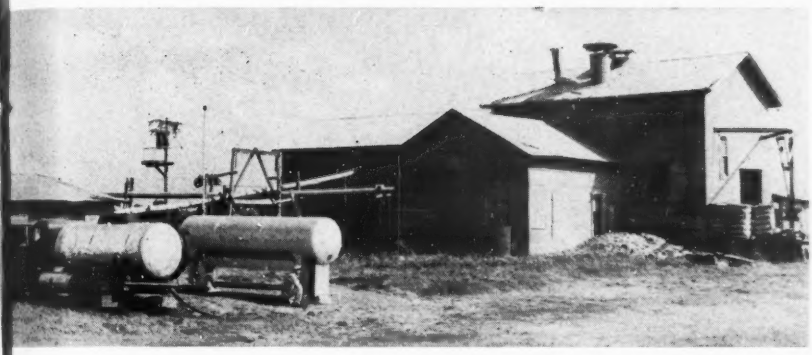
9. If bleeder valve continues to blow, hose is not disconnected until source of pressure is found and corrected to prevent escape of uncontrolled gas to atmosphere.

10. When no pressure is indicated by bleeder valve, hoses are disconnected and caps replaced on tank connections and hoses reeled or racked on truck to prevent driving off with hoses hanging.

11. Driver makes out delivery ticket and presents to customer. If it is necessary to shut off house supply due to empty tank, driver checks all appliances in house, then opens tank valve to regulator, returns to house and lights pilot lights, if any, to prevent possible hazard in house due to escaping gas.

12. If consumer is not at home, driver leaves note with delivery ticket advising that tank has been filled, that house line is shut off at tank and cautioning consumer to check appliances and pilots before turning on gas to prevent accidents in the house. This only applies if it was necessary to shut off fuel at time of filling.

13. Driver returns to truck and makes a complete circle around vehicle, removes wheel blocks and makes a visual check of hoses, valves, tool box cover, etc., to be sure truck is in fit condition for the road.



Bulk truck making delivery to storage tank at commercial dehydration plant.

COMMERCIAL AND INDUSTRIAL DELIVERIES

IN ADDITION to the usual precautions used in making a delivery to a domestic installation due to the varied nature of industrial and commercial uses, additional steps to assure safe deliveries are advisable.

Some of them are summarized:

1. When truck unloading spot is located where normal plant traffic is accustomed to travel, detour signs or road blocked signs are set out to prevent passage or collision from plant vehicles.

2. Before making fuel transfer, plant employe in charge is consulted as to readiness for delivery to prevent possible interference to plant operations.

3. Where open fire operations are going on in the near vicinity, operators are alerted that fuel transfer is about to be made so precaution can be taken in event of an accidental fuel spill.

4. When deliveries are made to roadside businesses where there is liable to be customer traffic, truck is parked in the clear and, if necessary, warning signs or barricades are placed to prevent collisions or other accidents.

5. When dry hoses are used for transfer, care is taken to blow down hoses through vent line to safety valve stack or to some place in the open and any remaining liquid in the hose is carefully dispersed to prevent possible flash from uncontrollable sources of ignition.

6. Where water heaters or steam boilers used for heating vaporizers are located close to the unloading operation, doors are closed and kept closed until operations have been completed to prevent any possible accumulation of dispersed gas.

7. After filling operation has been completed, all plant filling connections are capped or plugged to prevent leakage through valves.

CYLINDER VALVE PROTECTION

Valves and connections to containers are protected while in transit and while in storage as follows:

1. By setting into recess of container to prevent possibility of their being struck if container is dropped upon a flat surface, or

2. By ventilated cap or collar capable of withstanding such a blow.

CHANGING CYLINDERS

THE RIGHT WAY IS THE EASY WAY

MANY in the industry confine their operations to the handling of LP-Gas in cylinders. Where these dealers are working with an integrated company, their functions are retail delivery and service and they are usually guided in their methods of operation by the safety rules promulgated by their supplier companies.

This arrangement has reduced the accident ratio in this type of business to a negligible quantity and the experience gained in many years of handling can well be applied by the independent operator.

Cylinder installations vary from a single cylinder setup to a multiple bank for larger users, and the sizes of cylinders vary from 60 to 200-lb. capacity, but the most common size is the 100-lb. container that weighs about 190 lbs. when full.

Most of the safety practices suggested are just common sense operations to prevent damage to the equipment and injury to handlers. The hazards incident to the characteristics of the fuel are reduced to minor factor due to the design and installation of the equipment and containers.

1. Before disconnecting a cylinder from the house line or manifold, the cylinder valve is closed to prevent escape of vapor to the air and to prevent air or moisture entering the cylinder on the trip back to the filling plant.

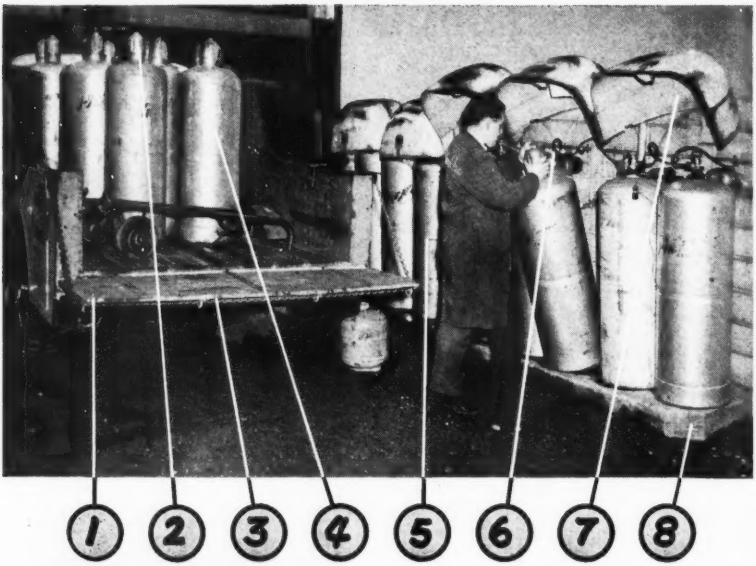
2. The cylinder valve connection is disconnected slowly, allowing pressure to bleed down before entirely removing nut. If pressure does not reduce, the cause of leakage is checked and, if necessary, the other cylinders are shut off to prevent escape of high pressure gas to the atmosphere while removing cylinder.

3. If it becomes necessary to shut off entire gas supply to house line, as when changing a single cylinder setup or due to need to repair or replace a regulator or changeover valve, gas is not turned into house line until all appliance burners have been checked and burner valves turned off to prevent accumulation of gas inside the house.

4. If customer is not at home when it has been necessary to shut off gas to house line, a card or note is left advising that full tanks have been delivered and gas is shut off at tanks, and instructing customer to check burners and pilot lights before turning on gas to prevent accumulation of gas inside the house.

5. Proper wrenches to fit cylinder valve connections are furnished and used to prevent damage to brass nut and difficulty in removing and tightening later.

6. Cylinder valve connection is examined for condition of threads, and dirt, if any, removed from tank valve before making up to prevent small leaks around connections.



CYLINDER HANDLING

1. Truck bed designed for cylinder handling.
2. Protector caps in place.
3. Hand truck for handling cylinders.
4. Cylinders vertical.
5. ICC approved cylinders.
6. Expansion loops in pigtails.
7. Protecting shield over valves and regulators.
8. Level and firm foundation for cylinders.

7. After full tank has been set and connection made, tank valve is opened and connections are checked for leaks to prevent loss of gas.

8. Protector cap is placed on empty tank to protect valves in transit.

9. Cylinders are rugged and built to safely handle the gas under pressure but they are not dropped or thrown from truck but are eased to the ground or lowered onto shock pads or mats to prevent denting and damage to foot rings.

10. When delivery truck cannot closely approach cylinder installation, hand trucks are used to carry the cylinders over lawns or rough ground to eliminate need for rolling them horizontally and thus reduce wear and tear on the cylinder and paint job.

11. In case the relief valve starts to open on a cylinder when being

transported or set, the cylinder is moved to a clear space and vented until the pressure is lowered and returned to the plant for check up and repair to prevent the escape of gas at the installation.

12. Cylinders are set plumb and square, and when hoods or cabinets are used the doors are closed or hood set in place and secured to protect valves and regulators from inclement weather.

13. Each time a cylinder is delivered, driver makes a check of condition of equipment, regulator, pigtails and immediate surroundings, and if rubbish or flammable material has been allowed to accumulate near the installation, he notifies customer to clean up the premises to prevent damage to equipment due to fire from outside source.

14. Delivery men are well trained in gas appliance service operations and perform necessary minor adjustments to customer appliances to maintain the efficiency and safety of the appliances.

15. Drivers carry test equipment and if they receive a consumer complaint of gas smell, a pressure test is put on house lines and appliance burner valves to locate leaks, if any, and gas is not turned into house lines until trouble, if any, has been remedied.

16. Full and empty cylinders are loaded and carried on trucks in secure position and held by chains or other means to prevent damage to them or loss of load.

THE HOUSE TRAILER CONSUMER

LP-Gas can be made the safest and most convenient fuel for house trailer use.

The house trailer market has been given to the LP-Gas industry without solicitation.

Due to the many manufactures of trailers and a complete lack of standardization of LP-Gas equipment, the delivery problem to this type of customer has raised serious problems to the industry.

Because of the shortage of housing, the house trailer has, in many places, become a semi-permanent abode for thousands of families and many trailer parks are located adjacent to the larger cities and towns.

It is incumbent upon the LP-Gas dealer to serve this market and at the same time to make this service a safe one.

Some of the problems and their solutions are indicated here:

1. Cylinders or containers without code labels or stampings are not filled by the LP-Gas dealer to prevent the use of unsafe containers.

2. Containers are removed from trailer and taken to an open area for filling to prevent possible accidents in crowded trailer parks.

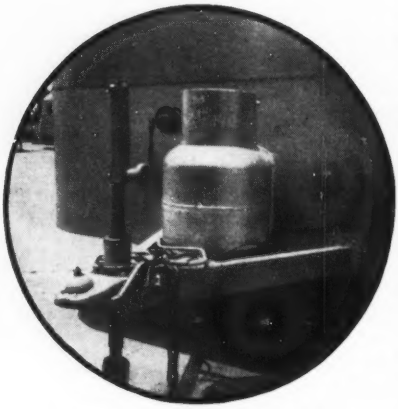
3. Containers are checked for working pressure and, to prevent opening of the safety valves, no fuel is used that has a vapor pressure higher than is allowed for the container.

4. Containers are checked for marking of water capacity and if it is not

shown, the capacities are computed and marked on the cylinders to prevent overfilling.

5. To prevent overfilling, cylinders are checked by weighing after filling.

6. On small cylinders, outage dip pipes are not used as means of determining correct level, as on fast filling the cylinders can be overfilled before the shutoff valves can be closed.



Bottle installation on trailer hitch.

7. Cylinders are checked to see that they have adequate safety valves or fuse plugs to prevent chance of rupture in case of fire exposure.

8. Regulator installations are checked to see that proper low pressure regulators are installed, as some trailer owners have installed makeshift pressure reduction systems which are not safe for operation.

9. Trailer piping is checked and tested for leaks to prevent trailer fires due to leaky lines.

10. Trailer appliances are checked for suitability for the use of LP-Gas to prevent accidents due to use of makeshift or improper utilization equipment.

11. Trailers are checked for method of attaching containers to see that vapor outlet always stays vertical to prevent liquid getting into regulator and trailer piping.

12. Where containers are mounted in trailer, check is made to see that they are in compartments separated from living quarters and well vented to the outside to prevent gas accumulation inside the trailer house.

13. Automatic heaters and water heaters are checked to see that fully automatic safety burner and pilot shut-off valves are installed, as many of the trailer homes have converted oil heaters and often have hazardous operating conditions.

14. Heater and water heater installations are checked to see that they have sufficient air space and air intake for good combustion, because in the cramped quarters of the trailer installations are found often that are not safe due to lack of air for combustion.

15. Trailer owners are warned of the effects of the operation of unvented appliances in a small room and are advised to provide venting for heaters or to provide ample ventilation for the entire trailer to prevent accidents due to lack of oxygen.

16. Containers brought to plants for refill are checked for condition and adaptability, and filling checked by weight to prevent overfilling or use of unsafe containers.

17. LP-Gas dealers refuse service to trailer units when unsafe conditions are known to exist and attempt to have trailer owners install safe equipment to increase the satisfactory use of LP-Gas and to prevent accidents which are detrimental to the industry as a whole.

SAFE RULES FOR HIGHWAY DRIVING

IT IS the personal responsibility of the driver to operate without accidents; to be alert so that he is not caught at the last instance in a futile effort to avoid an accident. Icy roads, curves, hills, narrow roads, the absence of signs, signals out of order, or carelessness, recklessness or ignorance on the part of others, do not relieve the driver of the slightest degree of his responsibility for safety.

Acquaintance with traffic rules and regulations pertinent to the state in which operations are carried out is necessary. Dealers should obtain copies of all regulations for drivers and discuss items applicable to the operation of their vehicles.

Some of the most vital operating rules for transport trucks often covered in regulations are listed below. Good drivers observe them.

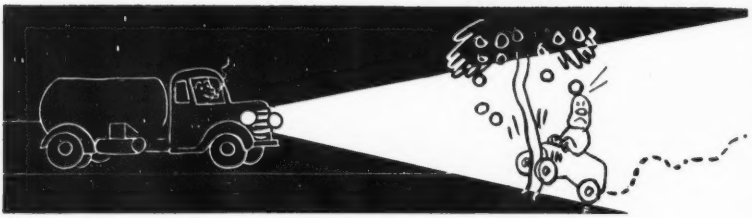
1. Subordinate rush to safety. No schedule of business is so urgent that unnecessary chances must be taken.

2. Take time to be safe. Delivery trucks should not be routed through business districts of town if alternate routes are available.

3. Don't pass on the right side of a vehicle unless proper clearance ahead and then only in an emergency.

4. Never pass on the crest of a hill.

5. Never pass on a curve.



6. Never pass at an intersection.

7. Never cross the double white line in the center of the road.

8. Never run abreast of another vehicle on narrow road.

9. Use horn with discretion.

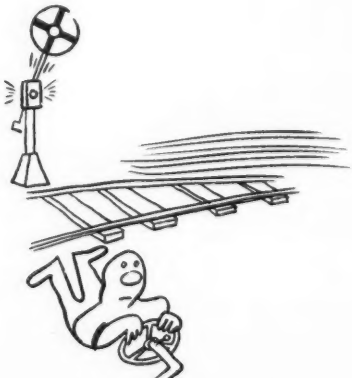
10. Show courtesy when another vehicle attempts to pass.

11. Avoid unnecessary conversation when driving.

12. Stop when school buses are unloading.

13. Observe school crossings.

14. Don't stop on travel portion of highway.



15. Never let your truck or car coast out of gear.

16. Use signs or lights when vehicle breaks down.

17. Dim headlights when approaching other cars.

18. Operate vehicle in accordance with weather and road conditions so that the vehicle can be kept under safe control. If conditions are such that safe operation is not possible, then park properly and wait until conditions clear up. If in doubt for proper procedure, telephone headquarters.

19. Always keep in mind proper speeds and distances. Good drivers avoid sudden brake application. They do not follow other vehicles too closely.

20. Slow and complete stops are made at stop signs and all railroad crossings.

21. Parking on grades should occur only when absolutely necessary. If it is necessary, the front wheel is turned into curb, the hand brake is applied, gears are set in low or in reverse, and chock blocks are used on wheels.

22. Do not allow riders on transport trucks.

23. Never demand the right of way.

24. Keep the cab ventilated.

25. Use proper hand signals.

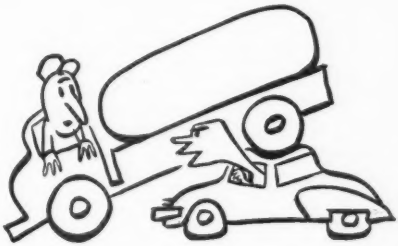
26. Keep to proper side of road when making turn.

2. If gas vapors should ever be detected around truck, motor is stopped at once, the leak is located, stopped if possible, and ample time is allowed for gas to disperse before starting again. If repairs can't be made by driver, phone plant for assistance.

27. Use tire chains whenever necessary.

Additional precautions which apply especially to LP-Gas trucks are these:

1. Extension handle to turn off main tank valve is carried in an accessible place. Main valve is always shut when truck is in motion.



TRUCK UPKEEP KEEPS DOWN ACCIDENTS

TRUCKS can be maintained in two different ways. One is to use a method of preventive maintenance which anticipates breakdowns and repairs and lends itself to economical and safe highway operation. The other is to operate until the unit breaks down, which results in delivery delays, towing costs, and introduces unnecessary hazards to the operations.

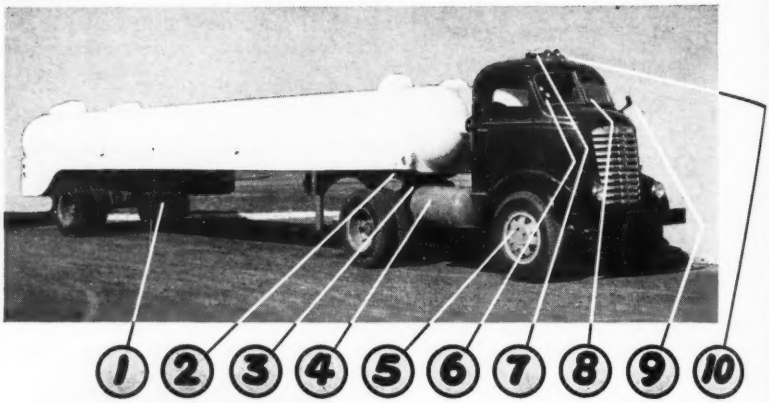
The mechanical condition of the truck runing gear and engines can be kept right with regular truck shop maintenance.

Condition of the balance of the vehicle which is directly connected with the handling of LP-Gas, can be maintained at a high point of safety by a few simple operations that can be made a habit. They are:

1. A daily inspection of the piping and the pump packing gland and if any leaks are noticed, correction of cause before they develop into serious trouble.

2. A daily check of the condition of hoses and hose valves and renewal or repair when wear or damage is indicated.

3. Maintenance in good condition of a kit of safety accessories, including



TRUCK CHECK

1. Tires for inflation and general condition.
2. Fifth wheel assembly for operation.
3. Reflectors for cleanliness and repair.
4. Fuel tank for adequate supply.
5. Wheel and rim lugs for tightness.
6. Windshield wipers and defrosters for operation.
7. Horn for proper volume and workability.
8. Brakes and hand brakes for adjustment.
9. Mirrors for cleanliness and repair.
10. Headlights for workability.

fire extinguishers, flash lights, first aid kit, reflector type road signals, and a tool kit with tools to fit pump packing gland nuts and valve packing gland nuts.

4. A check of road operating aids such as headlights, signal lights, clearance lights, defrosters, windshield wipers, rear view mirrors, chains and chock blocks.

5. Check rotary gauges and capacity gauges for packing gland leakage and keep tight and in good operating order.

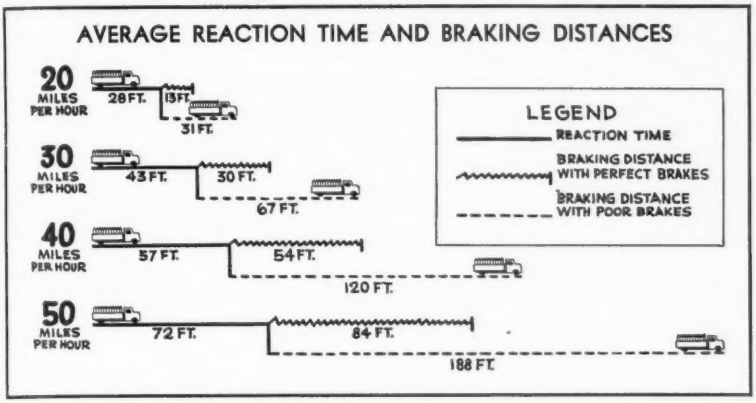
6. Check tank mounting for signs of movement or strain on piping.

7. Periodic tests of excess flow valves to be executed (in a safe location) to insure that they are operable in case of need.

8. Occasional check of safety valve outlets to see they are not stopped up by dirt or ice.

9. Removal and inspection of safety valves annually and, if necessary, reseated and reset by manufacturer.

10. Maintain flammable signs in clear and legible condition.



DEFENSIVE DRIVING

MANY LP-Gas dealers conduct instruction in the art of defensive driving. A defensive driver is one who makes allowances for the lack of skill and lack of knowledge on the part of the other fellow —who recognizes that he has no control over the unpredictable actions of other drivers and pedestrians, nor over the conditions of weather and road, and who therefore develops a defense against all these hazards. He concedes the right of way and makes many other concessions to avoid collision.

The defensive driver thinks ahead about what might happen and is ready for any emergency. He anticipates trouble by thinking for the other fellow, thus avoiding situations which might result in an accident.

1. The defensive driver never puts complete faith in the other fellow's hand signals.

2. He is always prepared for the motorist who ignores stop signs.

3. He knows that some drivers will turn right even though traveling in the left-hand lane.

4. He keeps out of collisions by slowing down at intersections.

5. He avoids ganging up and following too closely.

6. He keeps to the right and lets inexpert and speeding drivers go on their way.

7. He pumps the brake pedal to flash a stoplight warning to the motorist behind.

8. He gives adequate and timely signals and has the necessary skill to provide that added margin of safety in emergencies.

Is defensive driving worth while? Definitely! Study of thousands of accidents proves that few are caused by mechanical failure. Usually both drivers fail in some degree and each is partly at fault. In most cases, either one could have avoided the accident had he been a defensive driver.

All valves, piping and connections above deck.

All tank openings protruding through deck.

All safety vents piped to common header leading to stack on vessel's mast.

All piping provided with expansion joints and bends.

MARINE SHIPMENTS

IN CONTAINERS OR BULK

MARINE transportation of LP-Gases falls into two categories; first, by deck or hold cargo and, second, bulk transportation in vessels specially fitted for the trade.

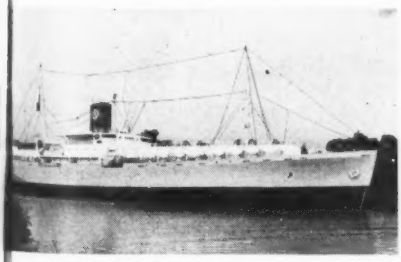
The handling of LP-Gases by vessel is under control of the Coast Guard and that body has special regulations covering the method of stowing, requirements for containers, marking, and fittings.

Special regulations are also in effect for the design of bulk cargo carriers and their operations.

Operators involved in the export trade or where their product moves on water carriers, observe, beyond the other requirements, the following safety practices:

1. Cylinders used for shipping LP-Gas aboard vessels comply with ICC specifications in order to comply with the marine requirements.

The "Natalie O. Warren" bulk transport.



2. When cylinders of a foreign manufacture are received from a foreign country for recharging, they are subjected to test and refilled to insure standards of safety on U. S. vessels.

3. Shipping containers are specially labeled with distinctive red gas labels so they can be easily recognized by the handling crews.

4. Harbor regulations for the handling and storage of LP-Gas on wharves are observed to reduce hazards.

5. Cylinder valves are protected by caps or ring protectors extending beyond the valves to prevent breakage of valves during handling.

6. "No Smoking" signs are posted near deck cargoes of LP-Gas cylinders to warn crew of presence of flammables.

7. Leaking or damaged cylinders are not accepted aboard ship to eliminate the chance of gas accumulation.

8. Cylinders are stowed on deck or in ventilated holds to prevent gas accumulation in case of leakage.

9. Cylinders are secured to prevent movement and damage.

10. Permanent tanks are located away from the hull to protect them in case of collision.

11. Provision is made for venting safety valves of permanent tanks to a clear space above deck to remove chances of vapor collection.

12. Tank connections are located above deck to prevent gas accumulation in the holds.

13. Cargo tanks are built and designed to U. S. Coast Guard Code with safety factor of 4.5 for working pressure equal or above the vapor pressure of the liquid at 115°F to provide for cargo pressures in tropical waters.

14. Cargo tanks are spaced apart to allow inspection.

SAFE DISTANCES

FUEL CONTAINERS AND FIRST STAGE REGULATING EQUIPMENT SHALL BE LOCATED OUTSIDE OF BUILDINGS IN ACCORDANCE WITH THE FOLLOWING TABLE:

Water Capacity per Container	Minimum Distance Aboveground	Distance Underground	Distance Between Aboveground Containers
Less than 125 gals..	10 ft.	None	None
125 to 500 gals.....	10 ft.	10 ft.	3 ft.
501 to 1200 gals...	25 ft.	25 ft.	3 ft.
Over 1200 gals.....	50 ft.	50 ft.	5 ft.

INSTALLATION

Proper methods promote safety and customer satisfaction

DOMESTIC consumers, seeking safety and economy, look to LP-Gas dealers and distributors who sell, install, and service systems and appliances. Responsible LP-Gas men, therefore, take every precaution to make installations satisfactory in every way. They use only approved equipment and follow the recommendations of NBFU Pamphlet No. 58 as minimum standards.

Furthermore, since fires and accidents do occur from the misuse of all types of home appliances, every effort is made by LP-Gas retailers to educate consumers in safer use of their installations. They supplement the safe features built into domestic systems by supplying consumers with the know-how on getting the best performance.

The key man in this dealer-consumer relationship is the service man. His domestic installation tasks are considered the most important LP-Gas business. To back up the well-trained installer, dealers who do not actually have an engineer within their organizations serve and protect the public by a regular and continuing connection with a laboratory or a manufacturer of LP-Gas equipment. These experts are prepared with the latest information on safe utilization of systems and appliances.

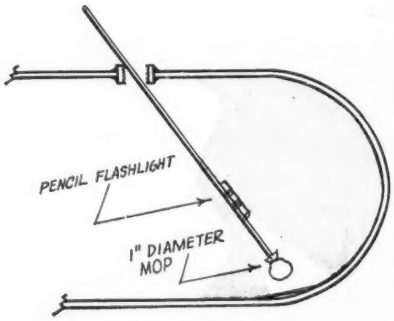
The competent, highly qualified LP-Gas dealer, then, supplements his sincere desire to deliver in every detail the safety and value purchased by consumers. They are not only selling equipment and gas; they make a special effort to understand the functional details of the systems and gases which they are required to handle properly.

ABOVEGROUND SYSTEMS

SAFE AND ACCESSIBLE LOCATION

LARGE consumer storage installations, as distinguished from cylinders in use on domestic systems, are normally permanent. Once properly installed, they remain in place as long as LP-Gas consumers use the fuel. In both types of installations, however, safe location and accessibility are major considerations.

Because consumer tanks are filled directly from delivery trucks, special care is taken to set them in a manner that insures safe liquid transfer. Recommendations of NBFU Pamphlet No. 58 specify correct equipment for both aboveground and underground tank installations. Containers are manufactured according to standards set forth in the Unfired Pressure Vessel Codes prepared by the ASME and API-ASME code-making committees.



Method of removing moisture from storage tank.

The installation of consumer storage containers is also subject to a number of established safe practices. To distinguish between methods of installing aboveground and underground systems, they are discussed separately here, aboveground storage first.

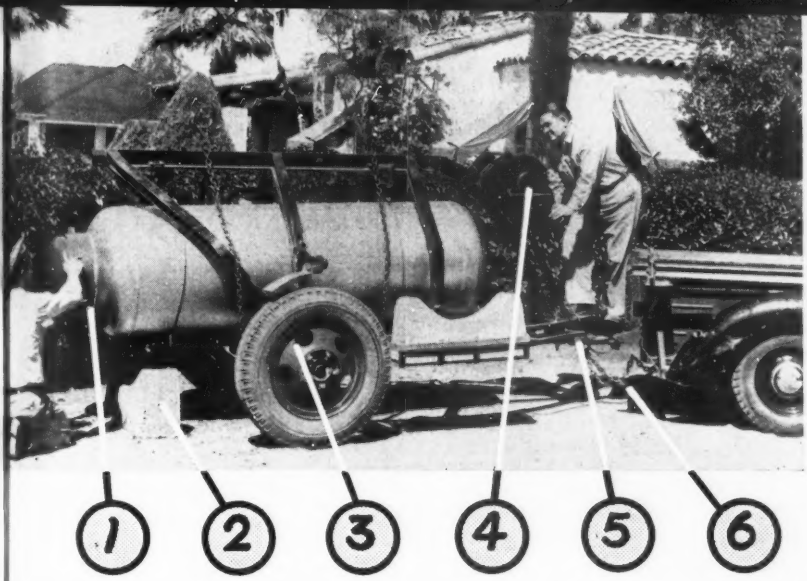
When safe practices are followed by service men, consumers are assured satisfactory installations. The tanks and other equipment are designed to hold the working pressure of the fuel. The installers make all connections gas-tight. These are some of the practices responsible for safe aboveground systems:

1. Due to the size and permanance of the installation, careful consideration is given to the location of tanks to insure safety in filling and use.

2. Tanks are so positioned that the fill valve is easily accessible without the use of unusual lengths of hose from the delivery truck to eliminate the need of adding extra hose.

3. When a good access road is not available to the consumer's house, tanks are located on property readily accessible by trucks to prevent awkward and unsafe filling operations.

4. Tanks furnished are built according to codes recommended by the NBFU Pamphlet No. 58 to prevent



Domestic Tank Trailer

1. Guard to protect valves, regulator and fittings.
2. Concrete blocks to provide firm foundation.
3. Dolly designed to handle tank safely.
4. Lowering gear to place tank easily.
5. Foot rest for operator to stand on.
6. Safety chains to secure trailer hitch.

the use of ones that may not be safe.

5. Tanks are placed on firm foundations to prevent movement and strain on yard piping.

6. Tanks are set level to insure correct gauging.

7. Tanks are set with filling connections located in the most desirable direction to reduce exposure to buildings or openings in buildings.

8. When tanks are located in areas used by vehicles, tanks and fittings are protected by guards or bumpers to prevent damage.

9. Fill connections and regulators are protected by guards or ventilated covers to prevent tampering.

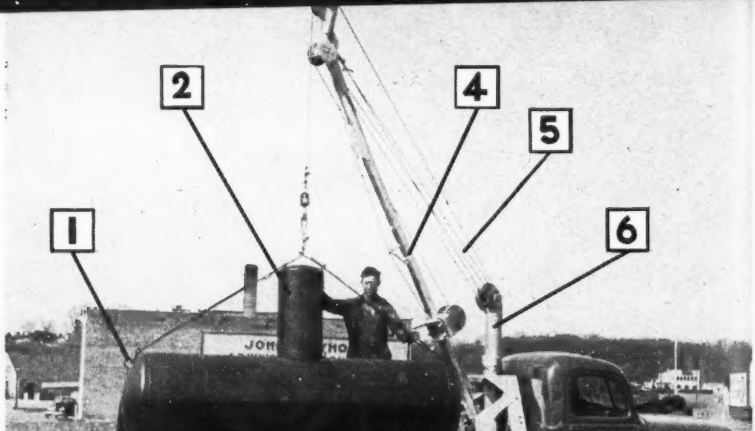
10. Safety valve discharge is pointed vertically and is located so vapors can escape without impingement or deflection from guards or covers.

11. Pressure reducing regulators are set at tank whenever possible to reduce pressure on yard lines to prevent accumulation of drips in piping.

12. Before tanks are delivered to consumer premises, they are checked for dryness and if any moisture is present, it is removed to prevent freeze-ups in regulators.

13. Before tanks are delivered, they are tested for leaks in fittings to prevent need of making repairs at customer location.

14. Due to the weight of the tanks, special equipment for delivery and handling should be used to prevent



accidents to workmen and damage to tanks and fittings.

15. Connections from tanks to house line inlets are buried at least 2 ft. below surface of the ground to prevent damage to the pipe due to gardening or weight of vehicles driving over lines.

16. Lines between tanks and houses can be of copper tubing or steel pipe, but if steel pipe is used it should be coated and wrapped to prevent corrosion.

17. Tanks are marked with flammable signs and customers are instructed to keep area around tanks clear of rubbish, dry weeds or other material that is readily ignitable, to prevent damage by fire to regulators and fittings.

18. Tanks are painted a light color to retard undue heat and prevent external corrosion.

UNDERGROUND TANKS

BECAUSE underground tanks cannot be visually inspected after they are covered, it is a special problem for installers to see they are well protected against damage.

To save dealers the expense of digging up tanks to examine for corrosion or other damage, these

Loading Equipment

1. Lowering hooks welded to tank shell.
2. Guard riser for regulators, valves, and fittings.
3. Wheel blocks preventing truck movement during loading.
4. Substantial rigging gear.
5. Boom to handle and lower tanks.
6. Sturdy king post and bracing.

recommendations will help servicemen do the job well on their first try:

1. To make certain that the protective coating is not damaged, particular care is taken in handling underground storage tanks. A small bare spot will start excessive corrosion on the tank.

2. The first step in determining upon a site for an underground tank is to locate active or abandoned house drains, sewer mains and water mains. The tank should not be buried near such underground piping because leakage from the tank or fittings could follow such piping into the building.

3. All tanks are inspected and tested for leaks at the fittings before they are moved to consumer premises. It is poor practice to discover that a tank leaks after it has been filled with gas at the consumer installation site.

4. Place fittings guards on tanks as the first step in handling them. The guard is not taken off until the tank is securely placed in final installation position. It is part of the job to transport tanks without damaging fittings.

5. If the tank is carried by truck, lash it to the truck body. To further secure the tank from slipping while in transit, wooden blocks are placed against it.

6. An overlay of all underground piping and septic tanks is examined before the LP-Gas storage site is selected. A place for the tank should also be marked with regard to providing future extensions on buildings.

7. All LP-Gas installations should be made within reach of a driveway that will withstand the weight of a delivery truck under any weather conditions. Tanks which can't be filled during a bad rain storm, may cause a shutoff of the consumer's fuel supply.

8. If it is absolutely necessary to make an underground installation in corrosive ground, a sufficient quantity of lime chips to counteract it are placed in the hole. Corrosion can cause leaks in LP-Gas tanks and connections.

9. If it is necessary to locate the tank in ground subject to a high water table, the plant is anchored with concrete. Because tank movement may break connections, the weight is used to prevent the system from floating.

10. Firm foundations are provided for tanks by tamping the surrounding soft earth or sand. Five or 6 in. of sand are also placed and tamped in the bottom of the hole upon which the tank will rest. As well as providing a solid base for the tank, it helps reduce corrosion.

11. The tank may be lowered into the hole by crane. Trailers especially built to haul tanks are usually equipped with block and tackle to lower the tank. The unit is pulled right over the hole into which the tank is to be lowered.

12. If, when making an installation, the job cannot be completed in the same day, the hole is covered with lumber. Also, consumers are warned of the existence of the hole to reduce danger of anyone falling into it.

13. Fine, loose dirt is thrown in first when filling the hole. This is done to avoid knocking protective coating off the tank with larger chunks of dirt.

14. If it is necessary to put a curb box in the driveway, a heavy cement collar is cast flush with the ground level, to help prevent damage to fittings.

INSTALLING THE YARD LINE - - MAKE IT TIGHT

FOLLOWING the final determination of appliance and storage locations, the yard line and house piping are installed, tested, and inspected.

Perhaps the most important consideration in making secure piping connections is the use of a proper set of tools. Servicemen equipped with good tools are more likely to thread pipe cleanly, to make tight connections, and to perform other piping operations well.

Here are a number of recommended practices, some of them set out in NBFU Pamphlet No. 58, for safe installation of the line:

1. Piping, fittings, and valves are of the type approved for use with LP-Gases. Wrought iron, steel, brass or copper pipe is used.

2. To withstand the pressure equivalent to the working pressure of the tank, piping and fittings are extra heavy up to the first pressure-reducing valves. All piping, however, is suitable for a working pressure of not less than 125 psi.

3. All screwed joints are made up tight and a joint compound that is insoluble in LP-Gas is used. The compound helps to make a perfect seal, but it does not set permanently. This makes it possible to remove valves or fittings at any time without damage.

4. Underground lines between the container and the building are installed below the established frost line and in no case less than 2 ft. below the ground level.

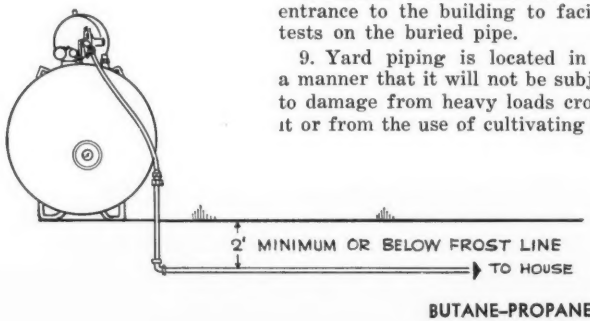
5. In extremely cold climates, or in areas where butane is used exclusively, a drip pocket is placed in yard lines. It is installed at the lowest point in the line and all piping is given a 1-in. to 10-ft. grade to that point to take care of any condensate that may form in the lines.

6. Underground steel piping is protected from corrosion by coating with protective materials and care is used to prevent damage to the coating when back-filling the ditch.

7. Bends or swing connections are used between the buried pipe and the tank and to the house connection to prevent damage due to settlement.

8. Shutoff valve is installed at the entrance to the building to facilitate tests on the buried pipe.

9. Yard piping is located in such a manner that it will not be subjected to damage from heavy loads crossing it or from the use of cultivating tools.



SELF-SERVICE UNITS

MADE SAFE FOR THE CUSTOMER TO HANDLE

IN places where the gas consumption does not justify the installation of a large cylinder setup or where the delivery distances are such that it is uneconomical to send a truck, the immediate needs of the customer have been satisfied with a cash-and-carry installation.

Due to the fact that these systems are serviced by the consumer, it is essential that they be foolproof and easy to change by people not too familiar with LP-Gas.

Features of self-service systems that insure the safey of this operation are:

1. All cylinders are built and maintained according to ICC regulations so it is possible to ship them to a refilling plant.

2. Cylinder valves are protected by a nondetachable guard or cap to insure that valves are protected while being handled by the consumer.

3. Cylinders are equipped with handles to reduce the possibility of injury to customers while handling.

4. Suitable installation brackets are provided to insure proper location and setting of cylinders at point of use.

5. Cylinder connections are simple and provided with wing nuts or other means to make connections without the use of tools or wrenches to prevent damage to the regulators or pigtails which might result from the use of tools by inexperienced hands.

6. Cylinder changeover control regulators have positive shut-off feature to prevent any escape of gas when empty cylinder is disconnected.

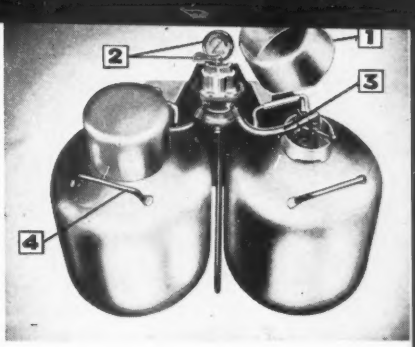
7. System is equipped with service gauge to indicate which cylinder is taking the load so consumer is easily able to determine the cylinder to change.

8. Excess flow valves are incorporated in the wing nut connection to prevent escape of gas due to accidental breakage of the hose or pigtail connection.

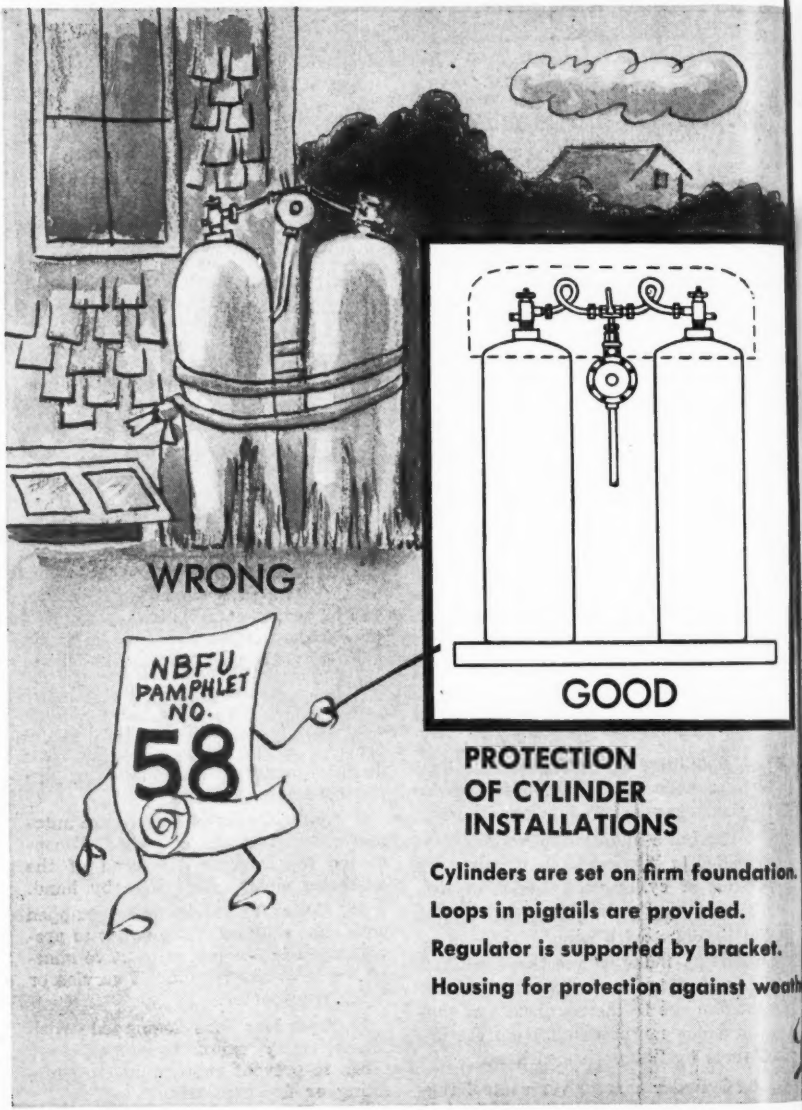
9. Cylinder shut-off valves are automatic to shut gas off when disconnected to eliminate the need of the customer closing the valve by hand.

10. Cylinder valves are equipped with caps chained to the outlet to provide a means to insure positive shut-off while cylinder is out of service or being transported.

11. Cylinders are equipped with either safety relief valves or fuse plugs to prevent rupture due to overfilling or fire exposure.



1. Guard to protect valves and fittings.
2. Service gauge and changeover lever for customer convenience.
3. Workmanlike connecting lines and fittings to provide safety.
4. Handles to aid in handling of cylinders.


WRONG
NBFU PAMPHLET NO. 58
GOOD
PROTECTION OF CYLINDER INSTALLATIONS
Cylinders are set on firm foundation.
Loops in pigtails are provided.
Regulator is supported by bracket.
Housing for protection against weath

CYLINDERS

THERE'S A PROPER WAY TO INSTALL THEM

THE use of LP-Gas from portable cylinders was started about 1925 and to the present time the number of installations in the United States is more than 2,500,000.

This method of distribution and use has gained its great popularity because of the simplicity and safety of the operation and because it amply covers the needs of many users beyond the reach of the piped gas systems for a supply of gaseous fuels. Installations vary from the single cylinder and the dual cylinder types to the multi-cylinder installations for commercial users. A few simple and sensible considerations govern the safety of these installations.

1. Cylinders are located in a place that is easily accessible for convenience and safety in making replacements.

2. Cylinders are installed on a firm, level foundation to prevent damage to the bottom ring from soil corrosion.

3. Regulator and manifold are firmly supported on brackets or from wall of building to prevent strain on house piping connection.

4. Location of cylinders with relation to windows, doors or other openings in the house, are governed by the recommendations of NBFU Pamphlet No. 58, which require a horizontal distance of 5 ft. from any opening below the safety valve outlet to prevent the possibility of vapors accumulating in or under a house should the safety valve open for any reason.

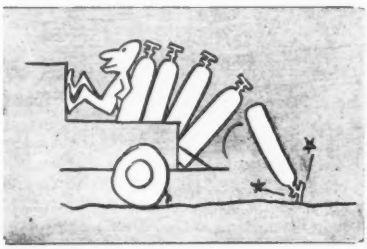
5. Cylinders are located in a position that is safe from accidental damage from vehicles, and if located in driveways or alleys, they are protected by substantial guards to prevent damage to the cylinder and the installation.

6. Connections between the cylinders and regulator on house piping is made with flexible copper tubing "pigtails" to facilitate the changing of cylinders without putting undue strains on the pipe and fittings.

7. Pigtails are factory made with proper connectors permanently attached to the tubing to insure gas tight connections.

8. A regulator is always installed between the cylinder and house piping to reduce the pressure of the gas to the proper appliance operating pressure.

9. Pressure regulators are equipped with a safety relief on the down-



stream side to prevent build-up of unsafe pressure on the appliance lines.

10. A shut-off valve is installed in the house line pipe in a convenient and accessible position so all gas can be shut off from the outside.

11. When installations are made in public places, such as school grounds, cylinder valves, regulators and equipment are protected by properly ventilated hoods or cabinets to prevent tampering and damage.

12. To prevent damage to cylinders and equipment from fire, rubbish, dry weeds and other flammable materials are not allowed to accumulate around the installation. It is the service man's responsibility to warn customers of the necessity of cleaning up such debris.

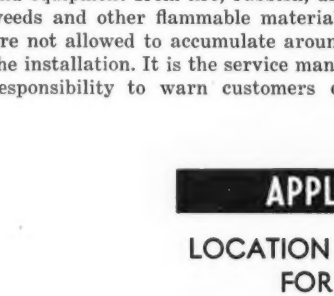
13. When it is necessary to install the pressure regulator inside of a building, provision is made to pipe the outlet of the relief valve to a point outside the building 5 ft. away from windows or openings into the house to prevent accidental accumulation of gas.

14. Vent lines from regulators are protected from stoppage by fitting outlet with bug screens and rain deflectors to insure operation of relief valve.

15. When possible, regulators are set to allow free drainage back to cylinder to prevent collection of entrained liquid in the pigtail and possible freeze-ups on heavy loads.

APPLIANCES

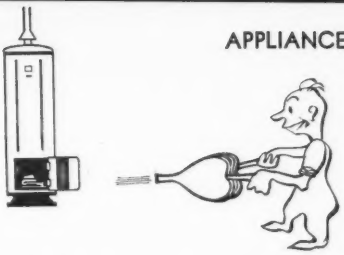
LOCATION IS IMPORTANT FOR SAFETY



There is an LP-Gas appliance for the four big domestic applications—cooking, water heating, refrigeration, space heating.

THE location of consumer storage and appliances is decided before piping is installed. If possible, appliances are placed in a manner that will require a minimum length of piping. The American Gas Assn.'s appliance installation handbook is a reliable reference on the subject.

Appliances are also set where conditions for ventilation and air circulation are most ideal. In most cases, the consumer will have a good idea where the equipment ought to go. It is up to the LP-Gas dealer to see that it will get there in good shape and operate safely once it is there.



Here are a set of practices which indicate the way appliance and piping installations are made:

1. When a new range arrives at the LP-Gas dealer's establishment, it is carefully uncrated and tested for burner and heat control adjustments. This precaution avoids the possibility of having to repair on consumer premises, a piece of equipment damaged in shipment.

2. When ready for delivery, the appliance is assembled and carried upright in the truck to reduce the possibility of damage enroute. Securely wrapping in blankets is advisable. Use hand-trucks in conveying appliances to and from the delivery truck.

3. At least two servicemen are necessary to make a range delivery. When lifting heavy appliances, just as in any lifting work about the bulk plant, servicemen use their legs instead of their backs to lift. Because inexperienced customers might injure themselves, they are not allowed to help servicemen unload appliances.

4. Before the equipment is moved from the truck, the location of the installation is decided and obstacles removed. If an old appliance is to be removed, it is done first.

5. Appliances are not connected until the yard line and house piping are tested. When connections to the main supply line are made, however, they are made on the top or the side of the main line. Lateral lines to individual appliances are more likely to become clogged if connections are made on the bottom of lines.

6. Close-fitting cabinet construction in kitchens has brought about the introduction of flexible metal gas range connectors. These connectors have factory applied union connections at each end. They are installed with a shutoff valve between the house piping and the connector. Without the use of such a flexible connection, it is difficult to make a gas-tight connection between the appliance and the wall.

7. A permanent and adequate air supply should be provided for appliances. This source of air for combustion and ventilation, of course, should not be subject to accidental interruption or curtailment.

8. Appliances are installed with an eye toward accessibility, so burner and pilot adjustments can be easily made.

9. Every appliance is checked and adjusted after installation to insure proper and safe operation.

10. Refrigerators are installed level and far enough from the wall to allow for proper air circulation around the condenser to eliminate future service calls.

11. Water heaters are installed in locations that are accessible for service and that have an ample supply of air for combustion to give satisfactory service.

12. Water heaters are provided with proper vents for products of combustion through vent pipes or stacks to the outside to eliminate contamination of the air within the house.

13. Space heating equipment is installed in accordance with the manufacturer's recommendations and, if a vented appliance, vents to the outside of the house are provided.

14. Appliances or furnaces should not be installed in basements unless means are provided for sufficient ventilation to prevent gas accumulation.

TESTING FOR LEAKS

All piping or tubing is tested after assembly and proved free from leaks at not less than operating pressures. Flame is not used to locate leaks.

HOUSE PIPING

IT'S PERMANENT . . . DO IT WELL

HOUSE piping may be installed as a building is being constructed but in many instances the LP-Gas dealer will obtain a contract to serve a building that was not originally piped for gas.

If the piping is being installed by the building contractor, the LP-Gas dealer should contact him and instruct him as to the quality of work required and the standards in fittings, pipe and joint compound. Many plumbers are not familiar with LP-Gas and as a result their work has to be changed.

House piping can be of steel pipe, or copper tubing and screwed or welded joints can be used on the pipe, with flare connections used on the copper. Soldered or sweated joints are not recommended unless high temperature solders are used.

A well installed job of house piping is trouble- and leak-free and will last as long as the house. Because it is permanent, it should be done carefully and well.

Some of the rules used by experienced installers are:

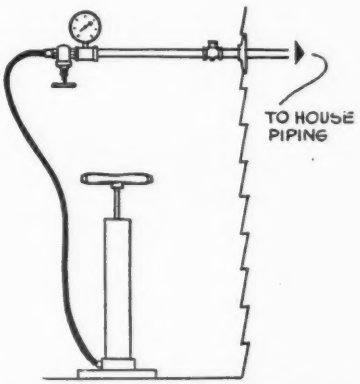
1. The installation is planned to take care of the present and future needs, lines of sufficient size and branches to possible appliance locations are installed to eliminate need of cutting into piping later.

2. As few unions as possible are used and then only ground joint type to prevent leaks.

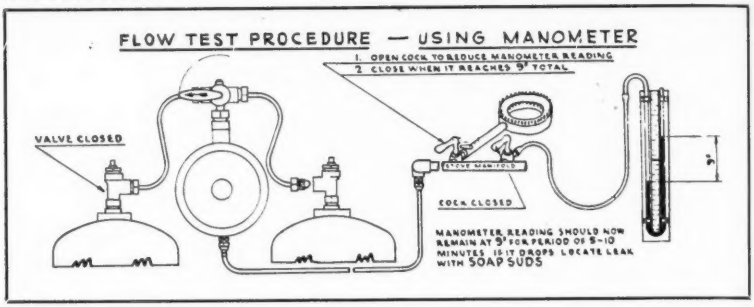
3. Where piping runs through walls or partitions and cannot be easily reached, no joints or connections are made as they cannot be tested for leaks.

4. Piping is run directly as possible without sags and is well supported to keep strain off connections.

5. Provision is made to take care of expansion and possible settling of the floors or building by bends or swing joints to eliminate strain on the piping.



Bicycle pump and gauge make simple the pressure testing of house piping.


FLOW TEST PROCEDURE — USING MANOMETER
1. OPEN COCK TO REDUCE MANOMETER READING
2. CLOSE WHEN IT REACHES 9" TOTAL
VALVE CLOSED
STOVE MANIFOLD
COCK CLOSED
9"
MANOMETER READING SHOULD NOW REMAIN AT 9" FOR PERIOD OF 5-10 MINUTES. IS IT DROPS LOCATE LEAK WITH SOAP SUDS

6. All threads are cut sharp and clean and are cleaned and doped with an LP-Gas type compound before being made up to insure tightness.

7. Only steel or malleable iron fittings are used on steel pipe and are made up to insure tightness.

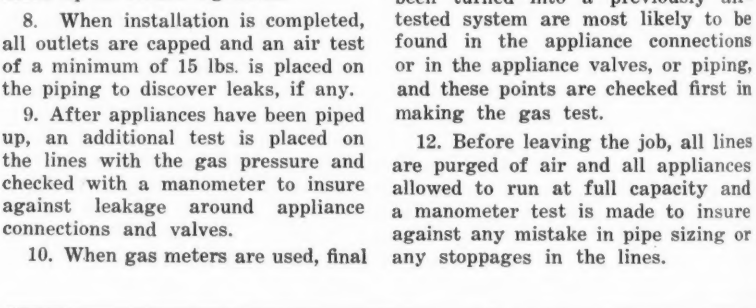
8. When installation is completed, all outlets are capped and an air test of a minimum of 15 lbs. is placed on the piping to discover leaks, if any.

9. After appliances have been piped up, an additional test is placed on the lines with the gas pressure and checked with a manometer to insure against leakage around appliance connections and valves.

10. When gas meters are used, final pressure test can be made by turning on the gas and observing the ½-ft. hand for a period of not less than five minutes. If the hand moves, leak tests are made to determine cause.

11. Leaks found after the gas has been turned into a previously air-tested system are most likely to be found in the appliance connections or in the appliance valves, or piping, and these points are checked first in making the gas test.

12. Before leaving the job, all lines are purged of air and all appliances allowed to run at full capacity and a manometer test is made to insure against any mistake in pipe sizing or any stoppages in the lines.



THE possible uses of LP-Gas on the farm are so numerous and varied that complete coverage of the farm problems is impossible in any brief summary.

Consideration will be given only to the large farm installation which consists of a central bulk tank from which the gas is piped to buildings and which also is the supply tank for field equipment.

Inasmuch as the handling of the fuel and the servicing of equipment is out of the hands of the fuel supplier after the delivery is made to the central tank, the equipment furnished is required to be convenient and safe to use.

1. The main storage tank is located in a clear area with a good access road for the delivery truck and farm equipment to facilitate ease and safety in the fuel transfer.

2. Where the tank is used to transfer fuel into mobile farm equipment, proper connections are installed to allow for vapor return when the liquid transfer is being made to eliminate the need of venting fuel tanks to the air.

3. A mechanical or hand pump, specially designed and built for LP-Gas service, is installed to prevent leakage.

4. A sign is installed in a position that can be plainly seen, advising operators to stop engines while refueling to eliminate source of ignition in case of a leak.

5. Skid tanks are built with proper rails and guards to prevent damage to tanks and fittings while being transported and handled.

6. Supply lines to buildings are connected to an outlet in the vapor space in the tank which is used for no other purpose. This prevents chance of interference with domestic and farm building supply while other transfer operations are being carried on.

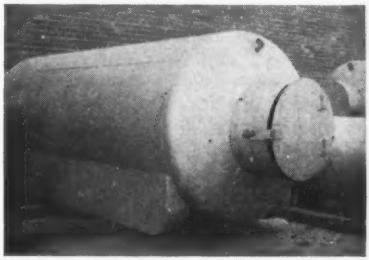
7. Pressure to building lines is reduced at the tank by a regulator. This also prevents condensate formation in the lines.

8. Lines are buried 2 ft., or more, to prevent damage from farm equipment or trucks.

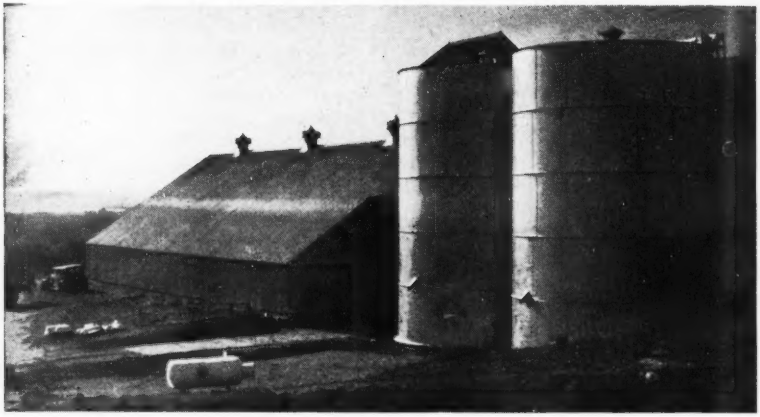
9. When trap wagons are used, care is taken to prevent accumulation of greases, oil, and rags to prevent causes of exposure to the LP-Gas tanks and fittings in case of a fire from that source.

10. Good hoses and connections approved for use with LP-Gas are used to transfer the fuel to prevent accidents due to the use of makeshift transfer lines.

11. A clear space or open-ended shed is used to store LP-Gas equipped farm machinery and field and skid tanks when they are not in use to



End-fitted skid tank with valves and fittings protected.



This 3000-gal. propane storage tank supplies fuel for many purposes, including miscellaneous farm uses and the operation of trucks and tractors.

prevent deterioration and damage to the tanks and equipment.

12. Where steam generators or hot water heaters are installed for sterilizing or other uses, full safety pilot and burner controls are installed to prevent accumulation of gas in case of temporary outage and subsequent turn on.

13. Yard lines are sized large enough to allow an even pressure to the utilization equipment on full load to prevent pilot light failures.

14. Piping, regulators, and hoses on the main tank are protected from damage from mobile equipment by guards or crash rails to prevent accidents from skidding or handling of equipment by inexperienced hands.

15. Farm operators are advised concerning the proper methods of handling LP-Gas, its general characteristics, the codes and requirements governing installations and use, to help prevent accidents due to lack of information on the product and equipment.

COMMERCIAL

THE commercial installation is one that is commonly installed by the LP-Gas operator and serves such establishments as auto courts, restaurants, bakeries, shops, resorts, and other medium size operations where there are employes of the establishment who control the use of the gas.

These installations are numerous and, though similar to large domestic installations, require a few special considerations.

1. Tank location is given extra consideration with respect to the operations of the establishment such as storage of crates and refuse, operation of trucks, incineration of waste,

and customer use of driveways or parking spaces, to reduce the hazard of accident to the installation.

2. If necessary, guard rails or other protection are installed to prevent damage to the tanks and regulator.

3. Tank and regulator sizing is given careful consideration to prevent low pressure or outage at the appliances due to overload on the system.

4. Piping is sized sufficiently large and is located so it will not be damaged by the operations of the user or his customers.

5. When wide variations between low load and peak operations are encountered, multiple regulator installations are made so both load conditions can be satisfactorily met.

6. Where appliances are operated by transients, they are installed so as to be easy to turn on and off, and positive venting or ventilation is provided to prevent accidents due to unfamiliarity with gas fuel.

7. Where vaporizers are used, provision is made for liquid level control to prevent flow of liquid into gas piping in case of overload or loss of heat supply to the vaporizer.

8. Where special equipment is used in the system that requires attention from the user or his employes, it is installed in such a way that it can be easily operated and simple instruction sheets are provided to guide the person making adjustments to insure consistent and safe operation of the equipment.

9. If it is necessary to make the installation in a location accessible to children, such as a school or playground, proper fencing or other precautions are taken to prevent tampering with the valves or equipment.

10. Where operators require gas at pressures over the standard low pressure normally used, separate lines are run for the high pressure gas or proper regulators are installed outside of the buildings to furnish low pressure gas supply for ordinary appliances to prevent chance of overpressuring standard equipment.

11. All automatic burner equipment is provided with 100% pilot and main burner shutoff controls to prevent flash backs or fire box explosions.

12. In operations where flexible hose is required such as irons, torches, etc.; a positive shutoff valve is installed in the line at the hose connection to allow gas to be shut off ahead of hose when not in use.

THE usual industrial installation is one that requires not only the LP-Gas dealer's knowledge but also that of a competent engineer.

The many ramifications of the end use of the product in these cases often require considerable technical investigation which requires a knowledge of combustion, equipment, and processing beyond the ability of the average layman.

Essential points of coverage required in determining a safe and efficient industrial installation are:

1. Study of the load requirement is made to determine the size of the tanks and vaporizing equipment to assure a sufficient supply to prevent fuel outages.

2. Where the LP-Gas is to be used interchangeably with other fuels, a

complete check is made of the burner equipment and its adaptability to the use of LP-Gas.

3. Where it is necessary to provide an air-gas mixture, equipment is selected and installed to hold a constant specific gravity or Btu value to prevent flash backs in burners.

4. Check is made of location of burners and utilization equipment to see that there is proper bottom ventilation to prevent gas accumulations in case of leakage.

5. Tanks are selected accordng to the fuel to be handled and are designed and built according to the governing codes.

6. Heat exchangers and vaporizers are selected for the load requirements and, if direct fired, are located in a safe location with respect to the tank filling connections to reduce fire hazards.

7. Due to the large size of the possible industrial storage installations and the relative congestion, suitable fire prevention equipment is provided in the form of permanent water spray installations and dry powder chemical protection to control any fires that may occur.

8. Care is taken in the selection of location of the storage to reduce the exposure of the tanks from possible sources of fires in the industrial establishment.

9. Where the hazard of shutoff of fuel to the end use dictates, special automatic, positive shutoff valves are used in lieu of excess flow valves to comply with the regulations without introducing undue hazards in plant operations.

10. Liquid or high pressure piping is of welded construction as far as possible to eliminate fittings and threaded joints wherever possible.

11. All fittings, valves, and appurtenances are selected to amply withstand the pressures encountered at possible elevated temperatures to reduce the possibilities of an LP-Gas fire in case of a serious exposure due to fire in the plant proper.

12. LP-Gas storage, mixing, and regulating equipment is fenced in to keep out unauthorized personnel from the operations.

13. Care is taken in the location of safety valve discharges and bleeding and venting discharges to prevent any discharged gases collecting or getting to possible points of ignition.

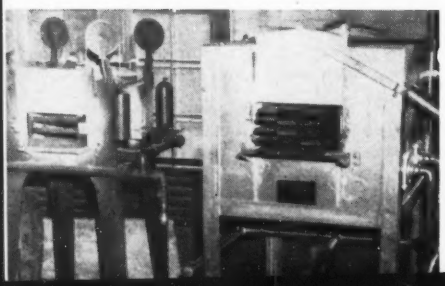
14. On air-mix plants, positive means are provided to prevent air introduction into the plant piping in case of a shutoff of the LP-Gas supply, or in the starting operations to prevent explosive mixtures being present in the gas piping.

15. Positive means are provided to prevent LP-Gas backing into air receivers of air compressors to prevent compressor explosions.

16. Where electric or other automatic controls are used, they are designed to go into the position that shuts down the plant in case of failure of the energy supply to prevent unsafe pressure or mixtures going to the plant piping.

17. Automatic controls are selected that require manual reset after plant shut-down to prevent turn-on after an outage before end use conditions can be checked.

Two types of industrial furnaces.



TOWN PLANTS

DESIGNED AND BUILT FOR SAFE OPERATION

A SECTION of the industry that is important but which operates quite differently from the average LP-Gas dealer or distributor is the piped town plant.

Although a part of our industry, with respect to source of supply and due to the fact that many town plant operators are interested in bottled gas and bulk delivery in conjunction with their meter systems, they are also public utility companies and in most cases follow the practices of the manufactured and natural gas industry.

Many of them operate under the control of utility commissioners whose rules and regulations take precedence over those under which most dealers work.

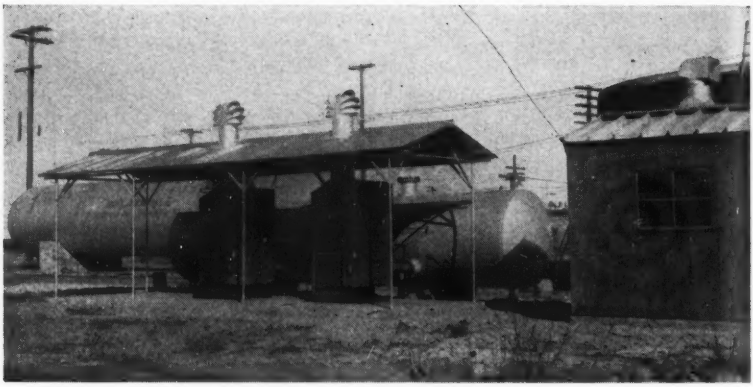
Besides the regular handling procedure of the fuel in the liquid form, additional safe practices are:

1. Competent engineering advice is obtained for plant design and distribution system layout to insure the safety and dependability of the operations.

2. Provision is made in plant design to eliminate the possibility of failure to provide gas to the distribution system to prevent a service shutdown and the expense and hazard of a complete individual turn-off and later turn-on for each meter.

3. A complete and accurate record of unaccounted-for gas is kept to hold down losses and prevent the possibility of a major leak causing a hazardous condition.

4. Distribution system leakage is



Vaporizers, air mixers, and storage tanks for LP-Gas town plant.

held to an economic minimum to reduce the hazards of line leaks.

5. When a distribution system is changed over from manufactured to LP - Gas, appliance locations are checked and proper means of ventilation are recommended to the user to provide for the difference in weight of LP-Gas and manufactured gas.

6. Automatic controls are provided at the plant to prevent entrance of liquid into the distribution system to avoid excess pressures developing.

7. Meters designed or rebuilt for LP-Gas are used to prevent leakage around packing glands and through body gaskets.

8. Distribution systems are preferably welded, or of cast iron with mechanical joints, to prevent drying out of packed joints and possible leakage.

9. The use of full automatic safety pilot and burner shutoff controls is recommended to the utility customers to reduce the hazards of flash-backs or accumulated gas due to pilot failure.

10. Tools and personnel are maintained available for emergency work on distribution system or plant to prevent gas outages due to accidental damage to mains.

11. When meters are disconnected, service lines are plugged and capped to prevent misuse or escape of gas in an unoccupied premise.

12. House piping is checked for leakage when meters are turned on and if any existing leaks cannot be located, service is turned off until repairs are made to prevent accidents due to gas leakage.

13. After turn-on, service men check and light all pilots on appliances to reduce possibility of customer accidents due to lack of knowledge of appliance operations.

14. All meters are provided with shutoff cocks located in a convenient and accessible spot so house gas can be shut off in an emergency.

15. Distribution system pressures are maintained within allowable limits to prevent pilot outages.

WHAT'S NEEDED TO INSURE A SAFE OPERATING POWER UNIT

BUTANE and propane are extensively used as fuels on trucks, tractors, buses, farm equipment and stationary engines.

It is adaptable to gasoline engines by making relatively minor changes to the engines and the installation of special vaporizing, pressure reduction and carburetion equipment, and fuel tanks suitable to carry the products under their normal pressures.

Operating data have proved the safety of these gases as fuels and in most cases they are less hazardous to use than gasoline.

A few simple precautions are essential to insure a safe operating installation.

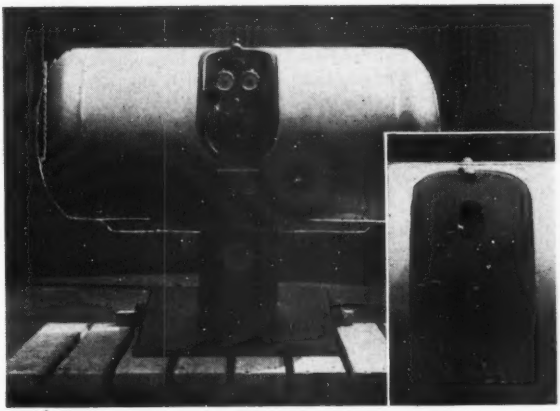
1. Fuel containers are made in accordance with the ASME or API-ASME codes with a working pressure high enough to safely handle the fuel to be used to assure safe carrying.

2. Fuel containers are mounted on the vehicles with sufficient road clearance to prevent damage to tanks from contact with the pavement.

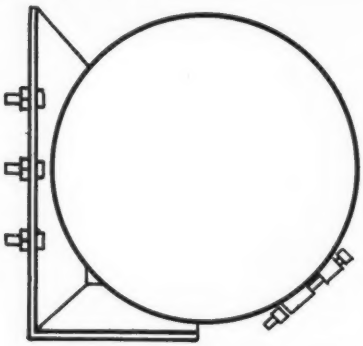
3. Valves and fittings on fuel tanks are located or guarded to prevent damage in case of collision.

4. Fuel tanks are firmly supported from the bottom by brackets or platform to prevent undue concentrated load on parts of the tank shell.

5. Fuel tanks are tied to brackets to prevent rotation or lateral motion to prevent damage to fuel line and connections.



Mobile fuel tank with recess and cover for valves.



Sturdily built tank bracket.

6. Fuel tanks are equipped with excess flow valves to stop outflow of liquid in case of a break in the fuel line.

7. Outlet of fuel tank safety valve is located so escaping gas will not enter cab or engine compartment. This is to prevent fires.

8. Fuel lines from tank to high pressure regulator are seamless copper tubing with flare type fittings encased in loom and firmly supported to prevent breakage due to vibration.

9. When possible, high pressure regulators are located on brackets attached to the chassis rather than on the engine to reduce the vibration in the liquid fuel line to a minimum.

10. When high pressure regulator is located on engine mounting, a high pressure flexible fuel line is used between the chassis and the regulator to prevent breakage of the fuel line.

11. When working on regulators or filters, fuel is removed from the fuel line and vaporizer by shutting off tank valve and allowing engine to run until fuel in the system is used up to prevent escape of fuel into engine compartment.

12. Before draining regulators, engine is stopped to prevent flash ignition from spark plugs or generator.

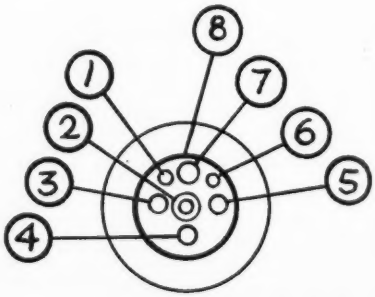
13. When general repairs are to be made on truck, fuel valve is shut off at tank and engine run until fuel in system has been used up to prevent accidental release of fuel to the atmosphere while working on truck.

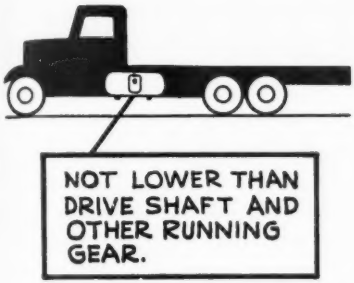
14. Fuel lines and connections are tested at regular intervals with soap suds to detect minor leaks that might develop into line breaks to insure full safety of operation.

15. When equipment is parked in closed garages, fuel valves are shut off at tanks after parking to prevent an accumulation of gas from any leakage through regulators or manifold.

Key to Fittings

1. Liquid line fuel valve—with pipe extending to bottom.
2. Vapor line fuel valve — with safety relief.
3. Safety relief—used when required.
4. 13½% outage valve—with pipe extending to required level.
5. Vapor return valve.
6. Rotary gauge.
7. Quick filler valve.
8. Guard to protect fittings.





16. On bus installations, engine compartment is separated from passenger compartment and intake air to the manifold is not taken from the bus interior to prevent fire or damage to passenger compartment from back-firing of the engine.

17. Fuel tanks are filled out of doors to prevent gas accumulation in buildings in case of broken hose or leaking fill valve.

THE BUTANE SERVICE STATION

MAKE IT FOOL-PROOF FOR ATTENDANTS AND PUBLIC

AS the use of butane and propane for motor vehicles expands, the requirement for convenient filling service increases and the tendency is to locate these facilities in large truck stations where other fuels are also dispensed.

Some of these stations are in the commercial districts of large cities and others along the highways.

Inasmuch as they are operated by personnel that come and go and by necessity are located in areas of heavy concentration and movements of vehicles, the experience in design and operation of such units that have operated successfully for years without accidents should be followed.

1. Storage tanks are located with consideration being given to operations on the property and adjacent property to reduce the outside exposure to a minimum.

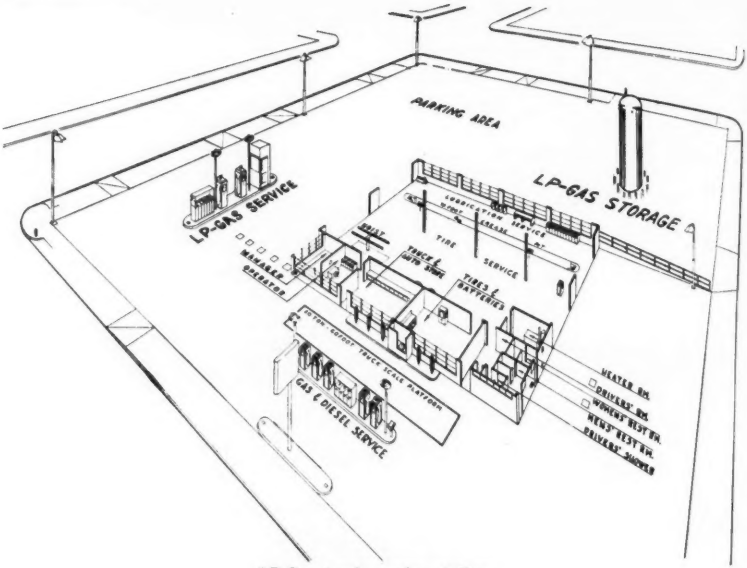
2. When aboveground tanks are installed, they are properly protected by crash rails or guards to prevent damage from trucks backing or running into them.

3. Where underground tanks are used, they are buried deep enough and protected by a slab to prevent the weight of the loaded tanks imposing direct loads on the tank shell.

4. Filling connections for either aboveground or underground tanks are located so the tank truck is in the clear of traffic when being unloaded to prevent collision and damage to hoses and filling connections.

5. Connections from underground tanks are protected by a suitable manway, and shutoff valves are operable from the surface by use of extension handles to eliminate the need of the operator going down into the pit.

6. In order to eliminate the need of vapor return hose from vehicle fuel tanks, a pump is used that has



LP-Gas truck service station.

sufficient power to compress the vapors in the outage space.

7. A deadman control valve or equivalent control is used to prevent escape of liquid in case of hose breakage.

8. A hose nozzle that can be unloosened before detaching or a bleed valve between the valve on the end of the hose and the tank adaptor is used to check for leakage in the fuel tank fill valve before disconnection is made to prevent accidental escape of fuel when disconnecting.

9. Vehicle fueling spot is located away from grease pits where, under certain conditions, gas bled from gauges or spilled gas could collect.

10. Meters, hose and controls are protected from damage by curb or guard rail to prevent accidental damage in case of highway mishap.

11. Vehicle filling connections are located outside of buildings to prevent gas accumulation.

12. Hose racks are provided to prevent damage to hose and nozzle from trucks.

13. Hoses are not disconnected while another vehicle is driving up to filling island. This prevents possible cause of ignition.

14. During filling operation and connecting and disconnecting hoses, vehicle engines are shut down to reduce causes of ignition.

15. A good fire extinguisher of the dry powder type or CO_2 is kept available to knock out any flash fire that might be caused by gasoline fuel spills or dispersed gas.

FIRE PROTECTION

1. Prevention
2. Control
3. Extinguishment

FIRE protection comprises three aspects of fire: prevention, control, and extinguishment. They are independent phases of the fire fighting problem and involve both scientific engineering and safety training.

Fire prevention may be based on engineering know-how. Bulk plants can be made reasonably safe by the use of the best and most efficient equipment. Yet, a single unthinking act or a single relaxation of vigilance by an employe may counteract the effects of perfect design and expensive, protective installations. Therefore, it is equally essential to train personnel vigorously in fire prevention.

Control of LP-Gas fires may be a new idea to employes as well as to some professional firemen. In some cases, it may be undesirable or hazardous to extinguish a fire. It may be better to permit the fire to burn itself out, meanwhile protecting the areas and equipment exposed to fire, and holding the main fire in check to prevent its spread unless a means of stopping the flow of gas or liquid can be made possible by extinguishing the flames, or possibilities of reignition can be completely eliminated, or the pressure has dropped to a point where a closure can be made.

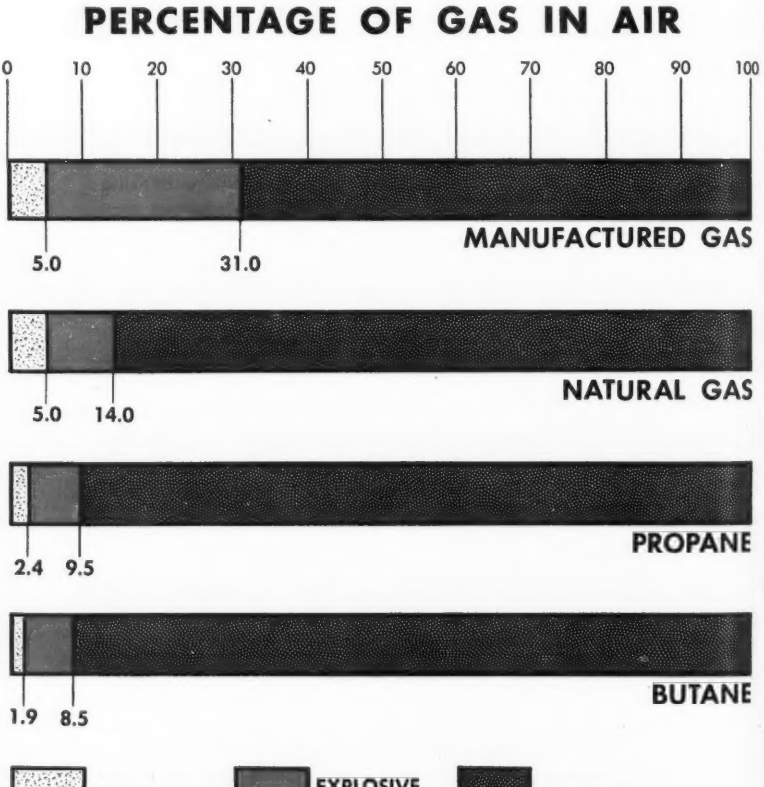
Fire extinguishment demands action; it must be quick action; it must be precise action, and it must be decisive action. It requires accurate knowledge of fire and this can be obtained only through training and experience. A training program should be planned to familiarize all LP-Gas personnel with control equipment and techniques. Complete instruction includes actual experience with fire fighting facilities as well as demonstration of the characteristics of the fuel. During the course of a training session, every type of equipment available to the operator should be used on different types of fire that may be encountered.

CHARACTERISTICS OF THE FUEL

KNOWLEDGE of the characteristics of liquefied petroleum gas —when it is safe and when it presents a hazard—is essential information for operators.

1. Butane and propane compare favorably with other gases that are commonly used, as is shown in the illustration below, which is Fig. 1.

2. LP-Gases are heavier than air



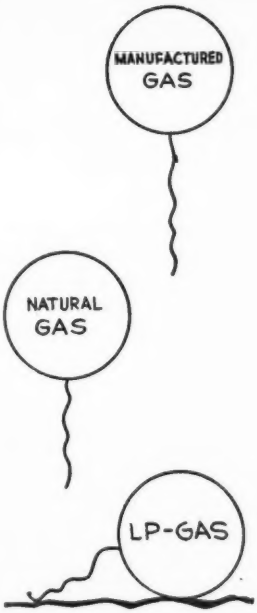


Fig. 2

and tend to settle downward, while natural gas and manufactured gases are lighter than air and will travel upward (Fig. 2.)

The practical result of this is that if a gas leak occurs, natural and manufactured gases will accumulate near the ceiling or escape through the vent or other openings, while LP-Gas vapors tend to accumulate close to the floor or flow out through bottom openings.

3. Good ventilation will disperse vapors of any kind, whether they are lighter or heavier than air, and good ventilation is essential for safety where any combustible vapors may be present.

4. Butane and propane, like air, are gases and tend to mix rapidly, as is the nature of all gases. This is known as dispersion and it is greatly accelerated if there is a movement of the gases due to agitation or air currents.

5. Flame cannot get into or exist inside an LP-Gas tank when it contains fuel because the vapors are not combustible without the proper amount of air being present. Leaking gas will burn from the tank outlets but the flame will not travel back into the tank. When the pressure on the tank decreases, the burning outlet can be safely snuffed out and capped off.

6. In general, it takes a higher temperature to ignite LP-Gases than it does to ignite paper but the flame from burning paper will ignite LP-Gases. This can be demonstrated by heating a soldering iron to just below red hot. If clean, it will not ignite gasoline or LP-Gas, but it will start a piece of paper to burn. The tops on full gasoline cans are safely soldered by use of soldering irons but care is always used to see that no flaming dirt, soot, or other material is on the iron. (Fig. 3.)

Fig. 3

FIRE PROTECTION

7. It is practically impossible to ignite LP-Gas vapors from the ordinary friction sparks, such as striking two pieces of metal together, striking a nail in the shoe on a concrete pavement, or the sparks from an emery wheel. Many experiments have been made that prove that, except under special conditions, ordinary friction sparks will not ignite vapor-air mixtures. Sparks from cigar lighters and gas lighters (which will ignite gas-air mixtures), are produced from special alloys and are not comparable to ordinary sparks.

8. There need be no mystery about LP-Gas. Its chemical and physical properties lie in between natural gas and gasoline and has some of the properties of each. Treat it as you would these two products, using equal precautions, and you will be safe.

9. Any liquid can cause an explosion. Water is a liquid and can cause an explosion. If water is placed in a closed container and heated to a little over 212° F., its vapor pressure will be increased to a point that it can be read on a pressure gauge. If additional heat is applied, the pressure will continue to rise and if the container is not equipped with a safety valve of adequate size, the container will burst. This is known as a boiler explosion. (Fig. 4.)

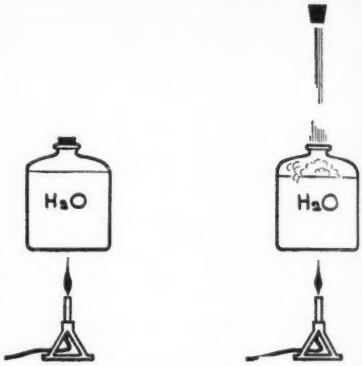


Fig. 4

10. Liquid butane or propane can cause an explosion similar to water. The difference is the temperature required to cause the increase in pressure. Instead of requiring a temperature of 212° F., atmospheric temperatures will increase the vapor pressure of these products so they cannot be handled in ordinary drums or cans. They must be stored and handled in special containers. All containers for LP-Gas must be of proper design

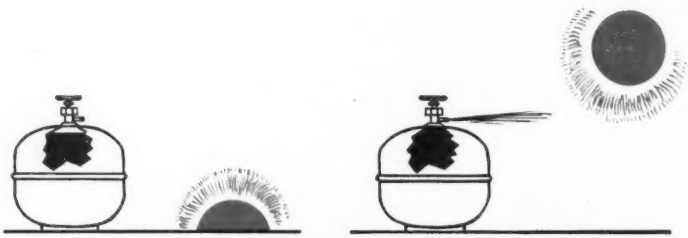


Fig. 5.

and construction and must be safeguarded against excessive pressures by adequate relief valves (Fig. 5).

11. Any fuel can cause an explosion. Wood, coal, kerosene, stove oil, gasoline and LP-Gas can be made to cause an explosion. If flame is applied momentarily to several fuels, natural gas, wood, coal, kerosene, gasoline, stove oil, and butane gas, it will be observed that the gases ignite very quickly and easily and the only liquid that will catch fire easily is the gasoline. The solids are not affected.

Actually, the liquid gasoline does not burn. It is the vapor given off from the gasoline that burns.

The kerosene and stove oil do not ignite because the vapor pressure of these materials is so low at atmospheric temperature that they are giving off no gas.

A little kerosene on a wick ignites readily because the heat of the flame immediately increases the temperature of the kerosene and raises its vapor pressure so it gives off enough vapor to burn.

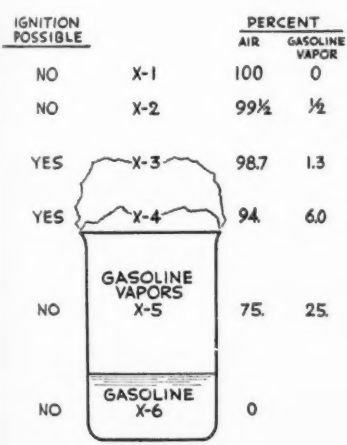


Fig. 6

Solid fuels also usually must first be converted to vapor before they will burn.

Finely divided solid fuel burns readily when exposed to flame just the same as kerosene. Flour, coal dust, and similar materials, suspended in air are easily ignited.

When ignited in the open, none of these fuels burn rapidly enough to cause an explosion.

To cause an explosion the fuel and air must be confined in a closed space, must be mixed in the proper proportions, and must have a source of ignition.

12. The proper proportions of air and gas to cause an explosive mixture are known. This is designated as the explosive range. The explosive range for gasoline is between 1.3 and 6.0% of gasoline vapor in air. This is illustrated in Fig. 6.

A beaker is partly filled with gasoline and a spark is made at the points marked 1, 2, 3, etc.

No ignition will occur in position 1 because the gasoline vapors have been dispersed before reaching this spot.

In position 2, although there is ½ of 1% gasoline vapor present, it is too lean a mixture to ignite.

Positions 3 and 4 are on the borderline of the explosive range, and the mixture of air and gasoline vapors will ignite.

In position 5, although there is 75% air present, the mixture is too rich to ignite.

In position 6 there is no air present so no ignition is possible.

13. LP-Gas is similar to gasoline but has a slightly narrower explosive range. Boiler type explosions are prevented by using approved code built and maintained containers fitted with proper sized relief valves.

Explosions of the other type are controllable by proper and safe utilization installations.

DON'T FEAR FIRE

LP-GAS IS THE EASIEST KIND TO CONTROL

IN training to fight fire, the men should be taught to move in close to the blaze. Thus, they learn the effectiveness against fire of water spray (commonly called "fog") and chemical equipment. Hysterical fear of fire, one of the greatest obstacles to adequate control, is thereby dissipated.

Once an LP-Gas man has faced a major practice blaze with the proper piece of fire fighting device, he no longer needs to fear fire. He still has a wholesome respect for it, but fear retreats before understanding of fire and proper facilities for fighting it—essential objectives of fire protection training.

Intensive training for emergencies not only fits LP-Gas men to cope intelligently with any fire situation which may develop; it also equips them to teach and train others after the program is over. Opportunities for operators to leave business activities for thorough fire protection training are rare. It is the obligation of LP-Gas dealers, therefore, to see that they and key employes gain fire fighting experience and pass on their knowledge to fellow workers.

Employe reaction to the fire situtation ought to be virtually automatic. Frequent and rigidly disciplined drills are the answer to meeting coolly any crisis which may arise. The time to think about proper fire protection is not after a blaze is already under way. Snappy instruction spaced at not more than monthly intervals will keep everyone who handles fuel continually alert. These drill periods, which should be under supervision of the dealer, will not only help fire control and extinguishment; they also aid in maintaining fire prevention.

There is seldom time for preparation when a fire is in process. The first five minutes of any fire are the most important. Records show that fires discovered and properly attacked in the first five minutes frequently can be handled by first aid fire equipment. Fires which are not caught in the first five minutes frequently result in huge losses. An exacting training program is the most substantial answer to undelayed, efficient fire control and extinguishment. All employes should be taught to call the fire department first and then make effective use of facilities provided.

The discussion that follows on the three classes of fire is a skeleton outline. It is informative for LP-Gas dealers to the extent that it points out the types of fire that may happen during operations.

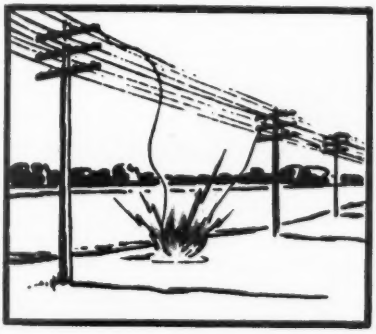
In a properly designed and maintained bulk plant where good housekeeping is the rule, there never

CLASS 'A' FIRES

Class A fires: Miscellaneous combustibles such as wood, paper, textiles, rubber, and trash. They are best fought by removing heat. Water is the best medium.

CLASS 'B' FIRES

Class B fires: Flammable liquids and vapors. Best fought by smothering, although cooling is sometimes effective. These are subdivided into: a. Contained fires, in tanks, vats, and sumps; b. Running fires, involving a flaming stream substantially in one plane; c. Three dimensional fires, in which fuel is burning in more than one plane.



CLASS 'C' FIRES

Class C fires: Fire in or involving electrical equipment. Best fought by killing circuit and by smothering.

should be a Class A fire larger than can be handled with portable equipment. Office and warehouse buildings, however, are subject to fires, so soda-aid and water extinguishers, pump tanks and permanently installed garden hoses should be included in equipment.

In the case of Class A fires, dry compound or carbon dioxide extinguishers are effective in controlling, but final extinguishment must be accomplished by cooling, generally requiring the application of water.

In fighting a Class A fire, the stream is directed from the extinguisher to the base of the flames. The fuel must be "overhauled" after the fire to insure that no glowing embers remain which might cause re-ignition.

Class B fires comprise a special problem. Dry compound extinguishers are particularly effective on them, but foam, carbon dioxide and carbon tetrachloride units are helpful on small fires. Three-dimensional Class "B" fires, however, require water fog, carbon dioxide or dry compound units. LP-Gas fires which can be killed with dry compound extinguishers, must not be extinguished unless by so doing access to a shutoff valve is permitted. Otherwise, the fire is allowed to burn out, meanwhile protecting the exposed equipment by means of water streams or fog nozzles.

Fires in or involving electrical equipment, Class C fires, may be dangerous to the operator if improperly fought. Soda-acid or foam are never used because of the current-carrying capacity of the streams. Water may be safely applied with a fog nozzle at close range.

In any case, it is desirable to kill the circuit if possible before attacking the fire. Electrical fires may then be extinguished with carbon dioxide or dry compound. Carbon tetrachloride may be used if neither is available.

Suitable fire equipment depends on two factors: Size of risk and whether the fire anticipated is to be from burning liquid or burning vapor. It is economically impractical to provide for protection against every contingency at every installation. A suggested list is as follows:

Small Consumer Installations: At most, a small CO_2 or dry compound extinguisher or garden size hose.

Large Industrial Installations: At least one large type CO_2 or dry compound extinguisher and one combination water spray and stream nozzle on a 1-in. hose. Very large installations may require 1½-in. hose.

Bulk Delivery Tank Trucks or Trailers: One large CO_2 or dry compound hand extinguisher per truck.

LP-Gas Bulk Plants: At least one hand extinguisher per transfer unit. Wherever water pressures are suitable, a combination water fog and straight stream nozzle on 1-in. hose. Major water protection is considered available from municipal fire departments in this case.

Standby Storage: A properly designed automatic permanent water spray installation may be helpful if personnel is not always available and should be supplemented by fog nozzle protection. This is a specialist's problem.

EXTINGUISHING FIRES WITH DRY COMPOUND

Liquid propane escaping from a 1-in. "broken" pipe under pressure of 10 psi.

Liquid propane escaping from a ¼-in. pipe and directed against a steel baffle plate 6 ft. away until it was red hot. Pressure, 75 psi.

Liquid propane escaping from 6-in. diameter flange located 2½ ft. above ground level. A 4-in. section as measured on the chord of the gasket's inner circumference was cut from the 1/16-in. gasket. Pressure, 150 psi.

TYPES AND USES OF EXTINGUISHERS

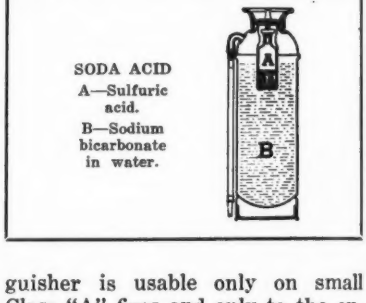
HAND fire extinguishers must be kept ready for instant use or they may fail to operate properly when needed. To maintain them in good working order, they must be inspected frequently, refilled immediately after use, and thoroughly serviced at least once a year.

The annual servicing may be carried on throughout the year by a few experienced men, who also take care of recharging. If a large number of extinguishers is involved, the work can be done at one time by a group especially assigned to this duty. Inexperienced men should be supervised to assure correct treatment and reassembly of each extinguisher. In no case should so many extinguishers be removed for servicing at the same time as to leave any area without protection.

Various kinds of fire extinguishers, and the classes of fires for which they are best adapted, follow:

Soda-Acid

The soda-acid extinguisher has little or no place on oil properties. It is dangerous to use on electrical fires because of the conductivity of the water stream resulting from its high salt content. Likewise, while the skilled fireman can use it effectively on a limited number of types of oil fires, it may cause a spread of the fire in the hands of the unskilled person. Generally, it may be considered that the soda-acid extinguisher is usable only on small Class "A" fires and only to the extent that 2½ gals. of water from any other source can be effective, if properly applied. As a rule, a garden hose is much more effective and is recommended for most locations wherein water can be used as the fire extinguishing agent.



SODA ACID
A—Sulfuric acid.
B—Sodium bicarbonate in water.

OPERATION: Carry extinguisher to fire and invert, directing stream from hose at the base of the fire.

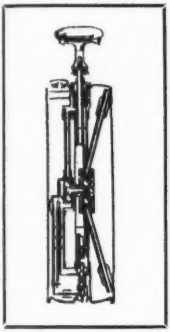
ACTION: When the extinguisher is inverted, a lead stopple drops from the acid bottle, permitting the acid and the sodium bicarbonate solution to mix. The resulting chemical reaction results in the formation of carbon dioxide gas which exerts pressure inside the extinguisher forcing the stream of water through the hose.

USE ON FIRES: The discharge from a soda-acid extinguisher is rated at 30 to 40 ft. but seldom will be effective at such ranges. It is

better to approach as near as possible to the fire before inverting the extinguisher. For the various classes of fire, the soda-acid extinguisher may be rated as follows:

Class "A"—Useful.
Class "B"—Do not use.
Class "C"—Do not use.

Carbon Tetrachloride



The carbon tetrachloride (vaporizing liquid) extinguisher has been a useful piece of equipment during the years it has been available. It still is useful in some locations. It has several faults, however, that justify its replacement by more generally useful extinguishers for most services.

OPERATION: Carry to fire, turn handle to release catch and pump, directing stream at base of fire or on side-wall of container.

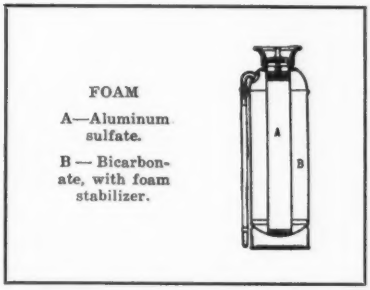
ACTION: A double action pump takes suction regardless of the position of the extinguisher and discharges a practically continuous stream of liquid. The heat causes the fluid to evaporate instantly, forming a heavy gas which will not burn nor support combustion.

USE ON FIRES: The discharge is rated at 20 to 30 ft. but will not be effective at such ranges except in the hands of an expert. As with other extinguishers, it is better to approach as near as possible to the fire before starting to pump. For various classes of fires, the carbon tetrachloride extinguisher may be rated as follows:

Class "A"—Useful on small fires.
Class "B"—Useful on small fires.
Class "C"—Useful.

Foam

For many years the foam extinguisher has been the standby of the petroleum industry. It is useful on many fires, particularly those in pans, tubs, or other containers, where there is sufficient outage to permit discharging the foam against the inside wall of the container. However, foam, especially relatively small quantities, is adversely affected by water or soda-acid discharge. Alcohol or acetone rapidly dissolves foam. Unusually high application rates and large quantities are needed.



Morever, the foam extinguisher is practically useless on three-dimensional fire.

OPERATION: Carry extinguisher to fire and invert, directing stream from hose at base of fire, against inside wall of container or form a spray by holding a finger loosely against the nozzle.

ACTION: The solutions mix, and, by a chemical reaction, form carbon dioxide gas. The stabilizer in the bicarbonate ("B" solution) holds the gas in the form of bubbles. The gas has no effect other than to cause the foam to float on the surface of the burning liquid. The foam blanket cuts off the air and smothers the fire.

USE ON FIRES: The stream is rated at 30 to 40 ft. but seldom can be directed effectively at such range. For the various classes of fires, the foam extinguisher is rated as follows:

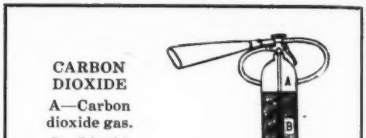
Class "A"—Useful.

Class "B"—Useful.

Class "C"—Do not use.

Carbon Dioxide

The carbon dioxide extinguisher, which is newer than the soda-acid, carbon tetrachloride, or foam extinguisher, combines the best features of each for petroleum property service. It is not suitable for Class "A" fires because it has little or no cooling effect but will control small ones. It will extinguish all Class "B" fires that can be handled by foam or carbon tetrachloride, as well as being suitable for vapor and three dimensional fires that cannot be handled by the others.



CARBON DIOXIDE
A—Carbon dioxide gas.
B—Liquid carbon dioxide.

It possesses the disadvantage that the gas stream is readily deflected in strong winds. However, because it leaves no residue it is especially suitable for use in indoor locations where wind is not a factor.

OPERATION: Carry extinguisher to fire and aim horn at fire. Pull locking pins if present and open valve or squeeze trigger or grip. Always aim at base of the fire and follow upward if three dimensional.

ACTION: The pressure of 850 psi (at ordinary temperature) forces the liquid carbon dioxide from the bottom of the extinguisher through the internal riser pipe and out the hose and nozzle.

USE ON FIRES: The effective range of the gas is from 3 to 5 ft., preventing the use of the extinguisher on widespread fires. In conjunction with fog, the extinguisher is usable on much larger fires than when used alone. For the various classes of fires, the carbon dioxide extinguisher is rated as follows:

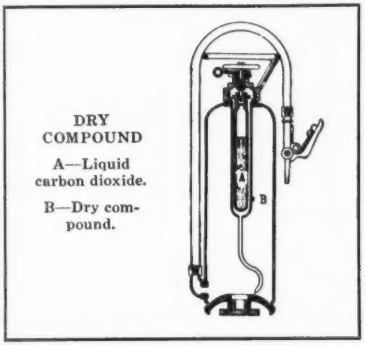
Class "A"—Controls small fires.

Class "B"—Useful on all fires.

Class "C"—Excellent.

Dry Compound

The modern dry compound extinguisher is highly efficient on oil or vapor fires. It is as good as either foam or carbon dioxide on Class "A" fires and can be used with perfect safety on Class "C" fires. It is particularly useful in conjunction with fog on large fires, having better spread and carrying power than carbon dioxide. The sodium bicarbonate powder is specially treated to render it water-resistant. Because of the directional drive of the powder, the extinguisher can be used in a high wind. Since the powder is visible, its path can be observed and can be directed to the best advantage. If not all of the charge is used, the remainder is available for as much as an hour, before the pressure leaks out.



DRY COMPOUND

A—Liquid carbon dioxide.

B—Dry compound.

OPERATION: Carry extinguisher to fire and set down. Pull locking pin, and turn valve wheel to left. Aim nozzle at base of fire, and squeeze the grip. Follow fire upward in the case of three dimensional fires.

ACTION: Turning the valve wheel to left punctures the pressure disc in the carbon dioxide cartridge, pressuring the outer chamber. Squeezing the grip-valve permits the powder to be blown out of the outer chamber. The powder has some cooling effect in itself, and absorbs additional heat in decomposing to give off carbon dioxide which smothers the fire.

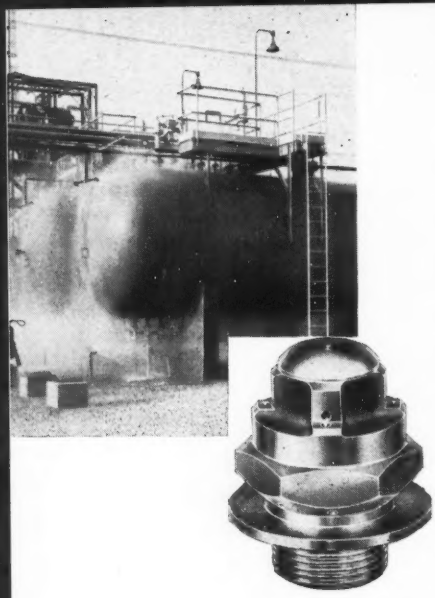
USE ON FIRES: The full size (20-lb. to 30-lb.) dry compound extinguisher is rated at 8 to 10 ft. discharge but, under average conditions, will do better. It is not necessary, and sometimes less effective, to approach the fire too closely. For use on the various classes of fires, it may be rated as follows:

Class "A"—Useful for control.
Class "B"—Excellent on all.
Class "C"—Excellent on all.

Water Spray (Fog Nozzle)

The primary essential to be kept in mind when selecting fire control equipment is its field of usefulness and its capacity. Water fog has been found very satisfactory for the purpose of protecting surroundings and to control the intensity of the fire.

Combination type spray nozzles that also provide a straight stream, for reach and hitting power, are most useful because they can be used not only to knock down fires under pressure but also to provide water screen protection necessary to make shutoff valves accessible. A number of makes of



Water spray system in action and (insert) a fog nozzle.

such nozzles are available, nearly all of them having advantageous features.

All those of large spray capacity seem to require pressures of 100 psi, or above, but some with smaller capacity for use on 1 in. and 1½ in. hose are amazingly effective at 75 lbs. and good at pressure as low as 50 lbs. and are suitable for use on 1 in. and 1½ in. hose. Short extension pipes (5 ft. or 10 ft. long), with low velocity sprays, are interchangeable with velocity sprays on some nozzles. Such applicators are handy for getting at "hard-to-reach" spots.

Spray nozzles to protect plant storage tanks may be selected on the basis of the coverage obtained at the actual nozzle pressure available with the understanding that fire department boosters may be able to increase their output and coverage.

WHEN TRUCKS ARE EXPOSED TO FIRE

THE LP-Gas truck, due to the fact that its tank is a pressure vessel, will often be able to go through accidents without material damage to the container that would be the cause of serious damage to other tank vehicles.

A well-designed truck will be built to minimize the chances of damage to piping and will be protected by internal valves or excess flow valves to prevent the escape of gas due to an accident.

It is, however, impracticable to build a unit that can anticipate every condition of accident.

The possibility of fire from the gasoline or diesel fuel tanks of another vehicle involved always introduces a fire hazard in a highway crash.

It is essential that the driver and law enforcement officers know the proper steps to take in case of a serious highway accident of an

LP-Gas carrier and the following procedure is suggested:

1. To prevent a fire, immediately set up temporary road blocks on either side of wreck until examination can be made for leaking fuel.

2. Shut off engine fuel supply at fuel tanks.

3. Examine piping and tank outlets for leaks or damaged fittings.

4. If serious leaks are evident, keep road blocked and spectators in the clear.

5. Eliminate nearby sources of ignition.

6. If possible, make temporary shut-off of leak by use of wooden plug, capping or other means.

7. If possible, dissipate leaking liquid with water hoses. This is also a valuable method of dispersing vapors if fog nozzles are used.

8. If repairs cannot be made, carefully unload contents of tank by connecting a hose line to one of the outlets to a point in the clear of the gas area and ignite the discharge and allow it to burn until tank is empty.

9. In an accident that results in a fire to the LP-Gas vehicle, check cause of fire and if it is not from LP-Gas, extinguish it.

10. If the fire is caused by LP-Gas, determine if the source of the leaking gas can be shut off before extinguishing.

11. If source can be cut off by a valve closure, control fire with water fog and make shut-off.

12. If shut-off cannot be made, control heat of flames and protect exposure by water streams or, preferably, fog.

13. Keep tank shell cool with water spray, especially on upper part or on any part that is being impinged with a jet of flame.

14. Tank rupture is improbable if the tank is kept cool but is possible if metal becomes heated to point at which the steel will lose its strength.

15. In a fire that is burning from a tank outlet and does not impinge upon the tank, keep tank cool with water and allow the contents to burn out.

16. When the pressure on the tank has reduced itself to a few pounds, it is safe to extinguish the flame and plug the outlet.

17. When a fire is burning only at the vapor outlet, or when the tank is leaking vapor without having been ignited, the tank may start to show a frost line at the liquid level due to the cooling of the liquid by rapid evaporation. Care should be taken when capping off to make a pressure-tight job as the tank pressure will increase as the contents warm.

ODORANTS

A SAFEGUARD FOR THE CONSUMER'S PROTECTION

THE object of introducing an odorant into any gas is to give it a distinctive smell which will be readily noticed when even a small amount of unburned gas is escaping or has escaped.

This odor makes gas leakage detectable at concentrations well below the lower limit of flammability. For example, NBFU Pamphlet No. 58 specifies odorization to be effective when the presence of gas can be detected by an odor down to a concentration in air one-fifth of the lower limit of combustibility. The lower limits of combustibility are specified as 2.15% of propane or 1.55% of butane. These figures represent volumetric percentages of gas-air mixtures in each case.

LP-Gas is usually odorized at refineries.

In order to determine quickly the results obtained from the quantities and types of odorants used, portable osmoscopes have been devised. These instruments are calibrated so direct readings may be taken quickly. These readings indicate the per cent of gas leaking into a room in which the observers noticed a distinct gas smell.

Careful control of the quantity of odorant is necessary because over-odorization of the gas will lead to unnecessary service calls. Test methods have been developed to check the concentration of odorant in the gas. The test is conducted by allowing a definite volume of gas to pass through sensitized filter paper. The color change of sensitized paper is used to compare quantities of odorant used.

Properties of the ideal odorant are:

1. The odorant must be physiologically harmless in any concentration likely to be encountered.

2. Its products of combustion should be harmless, non-corrosive and without odor.

3. The vapor should be relatively insoluble in water.

4. A small volume of the liquid should be capable of odorizing a large volume of gas.

5. The liquid should have a narrow boiling point and be sufficiently volatile to distribute itself readily into gas.

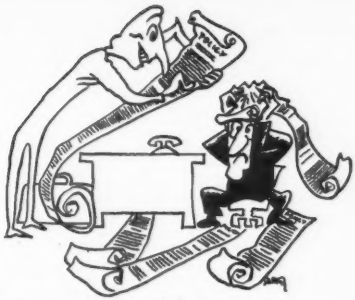
6. It must not react with common metals, meter or regulator diaphragms or gaskets.

Types of odorants:

1. Ethyl mercaptan.
2. Amyl mercaptan.
3. Petroleum derivative odorant.

INSURANCE

How to get it and how to keep it



PROPER insurance coverage in amounts to safely protect the dealer and the public is an essential requirement in the LP-Gas industry, as in any industry that serves the public with a form of energy that, by accident or design, can be misapplied.

The large utility companies serving electricity, gas or steam, the oil companies serving fuel and gasoline, and the transportation industry serving or meeting the public on the highways, protect themselves and the public by sufficient reserves or adequate insurance coverage.

The average LP-Gas dealer is not large enough to protect his own or the public's interest with reserve funds and it is incumbent that such protection be afforded the public.

The question of insurance can be divided into three main parts; namely, coverage required, how to obtain such coverage, and how to keep insurance.

The first two parts are fundamentals. The third part is controllable by the industry's record for losses and the individual dealer's cooperation in helping to keep these losses to the controllable minimum.

Our industry is experiencing at this time the same difficulties the oil and gasoline industry experienced in past years before they had proven the safety of their products by actual statistical information and by a control of operating practices that kept their loss ratios in a conservative bracket.

TYPES THE DEALER NEEDS

Insurance requirements break down into four main classifications for the protection of employes and the public.

1. Workmen's compensation which is legally required in 47 states.

2. Bodily injury and property damage liability incurred by the ownership, maintenance or use of automotive equipment.

3. Bodily injury and property damage liability incurred by the handling of fuel, appliances, or other merchandise, or the sale of products.

4. Comprehensive public liability to cover unusual or unnamed risks.

For protection of the dealers' interests, the usual forms of business insurance are desirable.

1. Fire, theft and collision for automotive equipment.

2. Fire and extended coverage on buildings, contents, plant, equipment, or other property.

3. Burglary and robbery of money, securities or merchandise.

4. Transportation insurance for cargo in transit.

5. Life, accident & sickness insurance for individual owners, partners and executive officers of the corporation.

ARE YOU ADEQUATELY COVERED?

Amount of Coverage

1. Workmen's compensation to cover medical care and provide compensation to workman due to inability to work, in the amount specifically required by the state or states in which the employe is working. Amount, type and type of carrier is specified in many states and these facts must be taken into consideration in arranging insurance. Employer's liability coverage should be included.

2. Bodily injury and property damage—automotive. Dependent upon the location of the operations, the size and type of equipment operated, and the relative exposures to accident involved in the operations. Twenty-five thousand dollars to $50,000 bodily injury and $10,000 property damage are considered minimums for protection and often operators are justified in going to much higher brackets as the additional cost is nominal.

3. Public liability incurred by the handling of fuel and appliances in the amounts of $100,000/300,000 for bodily injury and $250,000 for property damage are considered safe amounts for most operators but some may require still greater amounts.

4. Comprehensive liability can be provided to cover all legal liability hazards (bodily injury and property damage), including manufacturers' and contractors' liability, contingent liability, owners', landlords' and tenants' liability, contractual liability, products liability, and any other possible general causes of claims, named or unnamed. Limits recommended for this coverage are $100,000/300,000 bodily injury and $250,000 property damage.

5. Fire and theft on automotive equipment at value of equipment. Collision $100 deductible.

6. Fire and extended coverage on buildings, contents, plant, equipment or other property at today's new replacement cost less reasonable depreciation.

7. Burglary and robbery insurance to cover values at risk.

8. Transportation insurance to cover value of cargo against loss or damage by fire, explosion, collision or upset principally. All risks insurance is desirable.

9. Life, accident, and sickness insurance in appropriate amounts to insure continuation of the business in case of the inability of any key personnel to perform usual duties or services.

INSURANCE IS AN OPERATING COST

Insurance protection is available to the LP-Gas operator. Inasmuch as it is a specialized coverage, it is recommended that it be procured through brokers or agents familiar with the coverage available.

It is recommended that your local broker, unless he is qualified through experience in placing this type of coverage, work through one of the companies who have set up programs to provide inclusive insurance for the industry.

To control the risk, plant inspection is usually required and if necessary, changes in equipment and operations to insure safety will be required to receive full coverage.

How to Keep Insurance

The greater part of the LP-Gas industry is meticulous in its requirements for safe operation.

Some operators through lack of knowledge or lack of good judgment, may be operating in a manner detrimental to the industry as a whole.

The cost of safety is a part of the cost of operations as well as are wages, taxes, and cost of product. It is also an investment in the future of your industry. Include it in your costs, practice safe operating techniques, watch and report any infractions, and the loss ratio of the industry will prove its known ability to protect itself and the public. Only by developing a favorable experience through safety and education will insurance stay available and the cost of insurance decrease. As more knowledge of the industry's operations is available to the insurance carriers, and as our safety program and favorable experience is developed, our insurance business will be sought by all underwriters rather than accepted as an accommodation.

FREE INSPECTION PLAN FOR YOUR PLANT

ONE vital lack in the LP-Gas industry is an accurate record of accidents, their causes, and their results.

It is known, but difficult to prove, that the ratio of accident to business volume in the industry is good.

Accidents that have happened during the last few years have been greatly publicized, partly attributable to their spectacular nature.

Much of the publicity, however, has been exaggerated and often entirely untrue, such as the original, false reports on the fire and explosion of the liquefied and refrigerated natural gas storage at Cleve-

land in 1944; the explosion of a chemical plant in the heart of Los Angeles and the misapplication of the tanker fire on the S.S. Markay in Los Angeles in 1947, when a butane-blend gasoline was being handled as ordinary gasoline would be and not in pressure vessels as LP-Gas.

Reasonable Rates

The undue unfavorable publicity to our industry coupled with a tightened insurance market, has caused some difficulty in obtaining good insurance at reasonable rates.

In order to gather some of these facts together and to provide assurance to the underwriters that the plants they are insuring come within the standards of good practice, a plant and truck inspection form and questionnaire was gotten up by some of the engineers in the industry with the help of the insurance committee of the Liquefied Petroleum Gas Association and reference to inspection forms used by some of the larger operators.

An insurance plan was developed which provides that insurance would be subject to an inspection of plant, trucks, and a representative number of consumer installations. If corrections in operation or plant were found necessary from the inspection, these corrections would be made by the owner.

A number of plants have been inspected during the past year and most of them were found in satisfactory condition, sometimes it was found that simple, low-cost changes or improvements could materially increase the safeness of many of the operators visited.

The forms were made in such a way that they furnish the essential information necessary to evaluate the risk and also provide statistical data that can be grouped to determine the loss ratio of the selected risks.

Copies of these forms are reproduced herein to let the operator know what the inspection covers. It is suggested that each operator check his own operations, plant and trucks.

Extra printed copies of the forms are free upon request. All operators are invited to send for a set, answer the questions, and return the forms to us. (Please note that over-all photographs are essential.)

Free Service

Our technical editor will analyze them free of cost, indicate any unsafe conditions that appear, recommend changes to increase safety, and return them to the operator. This statistical information will be held in confidence.

If a sufficient number of these reports are received to compile an intelligent loss ratio for a large section of the industry, this information in its total figures will be published for the benefit of the industry to reduce the present high insurance rates but no individual figures or company names will be used.

(BUTANE-PROPANE *News* does not assume any liability for the use of these forms or the accuracy of the material contained herein.)

Of Course They're Safe!

Naturally, Ransome torches and burners are safe. That is, if you keep the flame turned in the right direction. If you don't, you will move faster than a lazy old nag with a cocklebur under her tail. They are really hot. Ask the guy shown above and he will tell you just how fast they melt lead.

We make a whale of a line of torches and burners. It takes two whole catalogs to show them. Of course, most of our customers don't like to read, so we have decided to put our stuff on display at the L.P. Gas International Trade Show which L.P.G.A. is putting on in Sacramento in early June. We'd like to meet you there!

RANSOME COMPANY

Designing and Constructing Engineers

4030 HOLLIS STREET EMERYVILLE, CALIFORNIA

Ransome

WILL YOUR PLANT PASS THIS TEST?

Name of company.....
Owner or manager.....
Mailing address..... City..... State.....
Inspected by ..... Date.....
Plant location .....

General information:

1 Type of business operated.....
2. Description of plant.....
.....
3. Delivery Equipment
1. Tank trucks..... 2. Pickup trucks..... 3. Flat rack trucks.....
3a. Automobiles: Number of .....
4. Transport Equipment:
1. Number of trucks and trailers..... 2. Semi-trailers.....
5. Fuel delivered to plant by: 1. Owned transport truck.....
2. Hired transport truck.... 3. Fuel suppliers' truck.... 4. Tank car..
6. Approximate yearly gallonage handled through plant.....
7. Approximate yearly gallonage delivered direct to consumer by transport.....
8. Approximate total gallonage..... 9. Number of years in business....
10. Past accident record (approximate number of accidents and total claims paid out or pending).....
11. General appearance of plant and equipment.....
12. Attitude of management and employes toward safety program.....
.....
13. Approximate number of customers.....
14. Approximate number of deliveries per day.....
15. Does operator own all customers' tanks?.....
16. If not, per cent of tanks owned.....
17. Number of customer installations visited.....
(Inspector should ride part of a regular route with driver until satisfied as to general character of installations.)
18. Conformity of customer installation to NBFU requirements. (List each installation visited.)
Tank size..... WP..... Code..... Location.....
Condition of tank and installation.....
Installation of customer owned..... Company owned.....

19. Photos:
Include four photos of general plant view taken from different angles to show general arrangement of plant and its relation to adjoining buildings or facilities.
Include one or two photos of details of piping, pumping facilities and loading facilities.
On back of photos show approximate distances and size of property.
20. Owner's valuation of plant.... 21. Owner's valuation of inventory....
22. Owner's valuation of trucks..... 23. Gross business per year:
a. LP-Gas sales $.... b. Appliance sales $.... c. Miscellaneous $...
24. Type of fence..... 25. Height of fence.....
26. What other, if any, commodities are stored or handled on same property? .....
27. What provision has been made for fire protection?.....
28. Condition of fire protection equipment.....
29. Number and location of flammable and no smoking signs.....
30. Can general public drive into operating area or is area protected by closed gate?.....
31. What is condition of plant with respect to weeds, rubbish or other flammable materials? .....
32. Are there any important nearby operations that would contribute to fire in case of gas leaks and has any provision been made to lessen the exposure?.....
33. If tanks are end connected are they located in such a manner that escape of liquid or vapor will impinge on other tanks or structures? .....
34. Transfer operation in plant:
a. Are trucks unloaded by plant pump or compressor?.....
b. Are trucks unloaded with pump operated by truck engine?.....
c. Distance of unloading spot from tanks..... d. Distance of unloading spot from nearest open flame (pilot light, heater or other source of ignition). Describe.....
e. How are hoses vented or drained after unloading?.....
f. Is unloading spot located so vehicle is protected from collision while emptying? .....
g. Are wheel blocks available and used?.....
h. Is plant man present during loading operation?.....
i. Are there any openings to basements or other places under platforms or buildings where escaping gas can collect near unloading spot? If so, describe.....
j. What employe is responsible for gauging tanks and operating plant valves before and after truck unloading?.....
k. What employe is responsible for connecting and disconnecting hoses? .....

l. If LP-Gas is received by tank car, is plant man present during entire unloading time?.....
m. What employe loads delivery tank trucks?.....
n. What employe is responsible for operation of plant valves?.....
o. Does plant fill other than owner's tank trucks?.....

35. Cylinder filling and delivery (to be filled in if 100 lb. and smaller cylinders are filled at plant):

a. Are cylinders filled in open or in a building?.....
b. If filled in a building, is proper ventilation provided?.....
c. Are filled cylinders all stored in vertical position?.....
d. Are scales in good condition and accurate?.....
e. Are cylinders filled by weight or by outage gauge?.....
f. Are cylinders tested for leaks after filling?.....
g. Are valve protection caps used?.....
h. What provision has been made to empty leaky cylinders?.....
i. Are cylinders well maintained and painted?.....
j. Estimated number of cylinders filled per month.....
k. Does plant fill other than owned cylinders?.....
If so, who is responsible for checking cylinders for proper service pressure and condition?.....

36. Dispensing Operations:

(To be filled in if retail deliveries are made to motor vehicles or to tanks brought into the plant by customers.)

a. What type of dispensing system is used?.....
b. Are dispenser and hose and piping adequately protected from damage by vehicles?.....
c. What type of nozzle is used?.....
d. What is condition of hoze nozzle?.....
e. Is dispenser equipped with dead man control?.....
f. What provision is made for taking care of stuck fill valve on a vehicle tank?.....
g. Is dispenser located in congested area?.....
h. Is dispenser located close to gasoline or diesel pumps?.....
i. Are vehicle tanks vented to atmosphere while filling?.....
j. What is maximum pressure that can be exerted on fill hose if pump is running and fill nozzle or valve is closed?.....
k. What provision is made to relieve pressure on hose due to temperature increase?.....
l. Are fueling operations done in other than daylight hours?.....
m. What is distance of dispenser from nearest open flame?.....
n. What provision if any is there to prevent damage to dispenser and piping if truck starts off before being disconnected?.....

37. Electrical Equipment:

a. Was electrical work installed in accordance with National Electrical Code?.....

Specialists

in Custom Built Tanks for Tractor and Truck Use

Santa Fe "custom built" tanks are now available for 30 different models of popular make tractors. Many of these are available for immediate delivery from stock. We will supply you with specification and price sheets if desired.

We have specialized in the design and fabrication of LP-Gas tanks for tractor and truck use and are able to provide tanks for nearly any type or make of mobile unit. If we don't have what you want . . . we can make it.

The above illustration shows a Santa Fe Tank installed on a Minneapolis Moline Universal Tractor. This tank utilizes the space formerly used for the gas tank. It is constructed so as to allow the steering column to pass through a tube welded into the tank. In this manner the steering mechanism is free of extra universal joints and installation is greatly simplified.

Tanks are shipped from our factory with mounting brackets, ready to install . . . JUST BOLT THEM ON.

Santa Fe Tanks are fabricated in strict accordance with ASME U-69 Code and NBFU safety requirements; equipped with UL approved valves.

SANTA FE ENGINEERING AND EQUIPMENT CO.

3810 Fruitland Ave. LA-1212 Maywood, California

b. Are there any non-vapor proof switches, starters, lights or fixtures in the area where LP-Gas is handled?..... If so describe:
.....

c. Are all motors in area vapor proof type?.....If not, describe:
.....

d. Is the area adequately lighted if night operations are carried on?..

38. Garage and Shops:
a. Are trucks stored in buildings?.....
b. Are garage and shop buildings where equipment is repaired constructed with proper vents to prevent gas accumulation?.....
c. Are tank valves on fuel tanks shut off at night when trucks are parked?.....

39. Fire Protection:
a. Is water available for fire fighting?.....State pressure, hydrant size, location, size and length of fire hose.....
.....
b. Is plant located in area served by a fire department?.....
c. Are plant personnel and owner informed on control of LP-Gas fires?.....
d. State kind, quantity and size of fire extinguishers.....
.....
e. Are extinguishers in good shape?.....
f. Are extinguishers located where they can be procured in case of a fire in the LP-Gas area?.....
g. Have employes and owner had any training or experience in handling LP-Gas fires?..... If so, describe.....
.....
h. Is any definite plan in force for owner or employes to check for leaks or other fire and accident hazards and for clean-up of plant?..... Is there any fire and accident prevention program in operation?..... Describe.....
i. Is plant protected at night time by watchman or plant man?.....

TANK TRUCK INSPECTION REPORT

1. Name of company.....Owner or manager.....
.....
2. Mailing address..... City..... State.....
3. Inspected by ..... Date.....
4. Location of inspection .....
5. Make of truck..... Owner's number.....

city ....
6. Has owner secured state permits? ..... Permit number .....
other ....

a. Does truck comply with specifications of Interstate Commerce Commission, and it is marked to indicate compliance? .....

7. Date purchased ..... Purchase price .....
8. Legal owner .....
9. Type—Truck ..... Truck and trailer .... Tractor and semi-trailer ....
10. Type of tanks—spherical ..... cylindrical .....
11. Number of tanks on truck ..... On trailer .....
12. Use—Transport ..... delivery ..... both .....

a. Is vehicle used beyond 50 mile radius? .....If so, describe regular and frequent trips in excess of 50 miles .....
.....

13. Power brakes ..... Type .....
14 General condition and appearance .....
15. Power unit—LP-Gas ..... Gasoline ..... Diesel .....
16. Method of unloading—pump (separate engine) .....
pump (power take-off drive) .....
gravity ..... other .....
17. Does piping conform to NBFU Pamphlet No. 58? .....
If not, describe .....
.....
18. Are there any valves, meters, gauges, piping, etc., located or supported in such a manner as to be easily broken off or damaged due to collision or roll over? .....If so, describe and suggest change to remedy .....
.....
19. Are tanks adequately supported and tied down to chassis? .....
If not, describe .....
.....
20. Are there any nipples or fittings between tanks and excess flow or automatic shut-off valves that could be damaged or broken, allowing tank contents to leak out? ..... If so, describe
.....
21. Delivery Trucks:
1. Give size and length of hose .....
a. Liquid ..... b. Vapor .....
2. Is wet hose used? .....
3. If wet hose is used, is there a shut-off valve ahead of hose connection? .....
4. Is there provision for relieving excess pressure in the hose? .....

5. Is hose in good condition?..... 6. When last tested?.....
7. Type of hose clamps?.....
8. Is hose reel used?..... 9. If so, what is diameter of drum?.....
10. Is pump by-pass in good order?.....
11. Is meter built for high pressure?.....
12. Is truck properly equipped with bumpers?.....
13. Is muffler located in such a position or protected adequately to prevent leaks from pump packing gland contacting muffler or exhaust lines?.....
14. Is truck equipped with drag chain?.....
15. Has truck proper flammable signs?.....
16. What type and size fire extinguisher is carried on truck?.....
17. Are wheel chocks carried and used?.....
18. Are running lights, side lights and rear lights in good order?....
19. What type of flares are carried?.....
20. Is driver well instructed in handling LP-Gas?.....
21. What precaution is used to prevent starting truck before hose is disconnected from customer tank?.....
22. Include one or two photos showing details of piping, meter, etc.
23. Note any leaks found.....

24. Tank Data:	Tank 1	Tank 2	Tank 3	Tank 4
a. Tank fabricator				
b. Year built				
c. Code and paragraph				
d. Mfg. serial no.				
e. State serial no.				
f. Max. W.P. @ 100° F. marked on name plate				
g. Working pressure PSI				
h. Shell thickness (inches)				
i. Head thickness (inches)				
j. Type of head				
k. Outside diam. (inches)				
l. Overall length				
m. Water capacity (gallons)				
n. Method of mounting				

o. Inspect mounting for signs of cracks in frame or supports and for proper reinforcing pads on tanks, note any points that are not in proper condition .....

In soft water areas

Micromet controls corrosion
and red water

Anywhere... **Micromet** improves
the performance life of
water heaters . . .
piping

Help your customers lick their plumbing troubles . . . get top efficiency from their water heaters. Micromet does it automatically . . . you install a Micromet Feeder, fill it, then the Micromet dissolves slowly and brings scale, corrosion and "red water" under control . . . with no effect on the potability of water.

Promote Micromet . . . it's an added service that gives your customers one more good reason for keeping you as their LP-Gas Dealer. You can install Micromet Feeders and supply Micromet for monthly refilling on regular calls. Write for complete details on how Micromet* helps get you in solid with customers and makes extra money for you.

**T. M. Reg. U. S. Pat. Off.*

HAGAN HALL BUROMIN CALGON

calgon, inc.

A SUBSIDIARY OF HAGAN CORPORATION

HAGAN BUILDING PITTSBURGH 30, PA.

25. Relief Valves:
    1. Make .....
    2. Catalog No. .....
    3. Stamped Setting .....
    4. Quantity .....
    5. Total rated capacity .....
       Cu. ft. min. LP-Gas .....
    6. Total required capacity .....
       NBFU 58 .....
       Cu. ft. min. LP-Gas .....
    7. Fuse plugs, quantity .....
       Area of fuse metal in each .....
       Thread size .....
       Melting point .....
    8. Location of relief valves and fuse plugs.....
    9. Are relief valves protected from damage due to roll over?.....
    10. Does discharge from plugs or relief valves impinge on tank or piping? .....
    11. Date of last test .....
    12. By whom tested? .....

26. Misc. Tank Data:

    Describe size, type and location of following:
    1. Press gauge .....
    2. Fixed dip tubes .....
    3. Vapor return .....
    4. Liquid outlet .....
    5. Liquid inlet .....
    6. Volume gauge .....
    7. Others .....

27. Are all required openings protected by excess flow or automatic shut-off valves?..... If not, describe.....
    .....
    .....

TANK AND PIPING REPORT

1. Name of company.....
2. Plant location.....

	Tank 1	Tank 2	Tank 3	Tank 4
3. Tank fabricator				
4. Year built				

YOURS FOR Bigger PROFITS

HUMPHREY L-P LAMPS

FOR HOMES, TRAILERS, CABINS AND STORES

Here's a profit making item that sells in every season. These rugged . . . handsome . . . dependable lamps are ideal for regular lighting service in homes, camps, trailers, cabins, stores and countless other places throughout the country. Write us now for complete literature and prices on these fast selling L-P Lamps.

A HUMPHREY PRODUCT

GENERAL GAS LIGHT COMPANY

KALAMAZOO, MICHIGAN

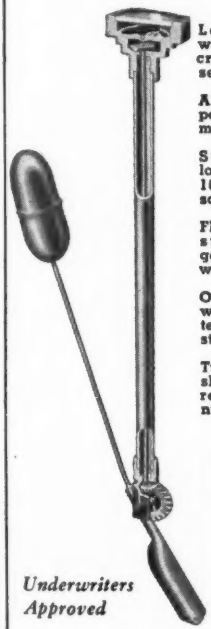
	Tank 1	Tank 2	Tank 3	Tank 4
5. Year installed				
6. Code and paragraph				
7. Mfg. serial number				
8. State serial number				
9. Max. V.P. @100° F. marked on name plate				
10. Working pressure PSI				
11. Shell thickness (inches)				
12. Head thickness (inches)				
13. Type of head				
14. Outside diameter (inches)				
15. Overall length—feet and inches				
16. Water capacity (gallons)				
17. Tank type (sphere, hor., vert., or underground)				
18. Method of Support:				
a. Steel supports (No. and size)				
b. Concrete saddles (No. and size)				
c. Steel skids				
d. Other (describe)				
19. Bearing pads				
20. Paint—Color, condition				
21. Manhole (size, type)				
22. Minimum distance from property line				
23 Minimum distance from buildings on property				
24. Minimum distance from building off property (if less than 100 ft.)				
25. Spacing between tanks (make rough sketch on back, showing important dimensions)				
26. Relief valves:				
a. Make				
b. Catalog No.				
c. Thread size				
d. Stamped setting				
e. Quantity				
f. Total rated capacity (cu. ft. min. LP-Gas)				

You KNOW This One

VISIBLE

You NEED This One

BUTANE OR PROPANE MAGNETIC FLOAT GAUGE



Large dial face with Plexiglas crystal. Moisture sealed out.

Alnico magnetic pointer and Alnico magnetic drive.

Steel float collapse-tests exceed 1000 pounds per square inch.

Float rod of spring steel cast into gear and counterweight assembly.

One-piece gear with shrouded teeth on stainless steel bearing.

Tubing and drive shaft of corrosion resistant aluminum alloy.

Underwriters Approved

ANHYDROUS AMMONIA LIQUID LEVEL GAUGE

Die cast dial chamber and removable stainless steel head.

Alnico magnetic pointer and Alnico magnetic drive.

Tubing of steel. Drive shaft stainless steel. Float rod spring steel.

All parts exposed to ammonia made of steel. All exposed moving parts of stainless steel.

Steel screw type (1½" and 2" pipe thread) or welding type adaptors available.

SEE OUR EXHIBIT

L.P.G.A. Convention and International Trade Show, Sacramento, June 1st to 6th.

Steel or brass adaptors available for LP Gauges.

TAYLOR SALES INC.

1213 SOUTH AKARD STREET, DALLAS, TEXAS

	Tank 1	Tank 2	Tank 3	Tank 4
g. Total capacity required NBFU 58 cu. ft. min. LP-Gas				
h. Fuse plugs				
1. Quantity				
2. Make				
3. Thread size				
4. Area of fuse metal in each				
5. Melting point				
i. Valves or piping between tank and relief				
j. Discharge vertical (if not, describe)				
k. Size and length of discharge pipe				
l. Height of discharge above ground				
m. Location of safety valves and fuse plugs				
n. Method of protection from rain and ice				
o. Date of last test				
p. By whom tested				
q. Were valves tight today, if not, explain				
27. Misc. Tank Data (size, type of valves on all openings)				
a. Pressure gauge				
b. Fixed dip tube				
c. Vapor return				
d. Liquid outlet				
e. Vapor outlet				
f. Liquid inlet				
g. Bottom drain				
h. Slip gauge				
i. Rotary gauge				
j. Others (describe)				
28. Are all tank valves identified with tag, plate or other markings?				
29. Are all required openings equipped with automatic shut-off, or excess flow valves?				
30. If there are any connections with fittings between the tank and shut-off valve, describe				

	Tank 1	Tank 2	Tank 3	Tank 4
31. Does tank have thermometer well?				
32. Size and range of pressure gauge				
33. When was pressure gauge last checked?				
34. Piping and Valves:				
a. Is piping installed in workmanlike manner?				
b. Any leaks in connections?				
c. Any leaks in valve packing glands?				
d. Any leaks in pump packing glands?				
e. Any leaks in compressor packing glands?				
f. What, if any, deviations from NBFU Code found in piping?				
g. Are all valves suitable for use, if not, explain				
h. Are tanks containing two vapor pressure fuels interconnected by present piping in such a way that high pressure fuel can leak back to low pressure tank?				
i. Is piping protected from damage from vehicles?				
j. Is piping protected by relief valves and if so, will their discharge impinge on tanks or piping?				
k. Is piping a welded job?				
l. Where screwed fittings are used, check all fittings for compliance with NBFU No. 58 and note				
m. Is buried pipe coated and wrapped?				
n. Condition of buried pipe				

35. Hoses:	Liquid	Vapor
a. Make		
b. Type		
c. Design WP		
d. Size		
e. Length		
f. Condition		
g. Type of hose clamps		
h. Type of connectors		
i. If wet hose is used, is there provision for relief?		
j. Are hoses protected from damage by vehicles?		
k. Age of hoses		
l. Are hose racks used?		

TRAINING

Makes operations safer

KNOWLEDGE of liquefied gases is the first responsibility of the LP-Gas dealer, the man who usually owns the company. He can then talk to his men with assurance and confidence. If he does not know the nature of the product, he will not recognize bad habits in drivers. He also cannot expect his employes to be willing to take time learning the fundamental nature of the gases.

Conditions within an operation, whether they relate to quantity and quality of product, morale, supervision, equipment, expense or the occurrence of accidents, reflect to a large extent the ability and attitude of top management. Too great emphasis cannot be placed on the value of dealer interest, support, and personal action in accident prevention.

A safety maintenance program should be adopted providing for all equipment to be examined by a competent person at regularly prescribed intervals, according to the recommendations of the manufacturer of the equipment. Drivers should be required to report promptly in writing to their supervisors any physical defects noted in trucks, cargo tanks, or other bulk plant equipment.

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THE DEALER'S RESPONSIBILITY

The dealer should give personal attention to:

1. The supervision of hazardous work and work that is new and unusual.

2. Adherence to a regular schedule of inspection and good housekeeping.

3. Personal investigation of all accidents, the determination of their causes and methods established for preventing their repetition by correction of any unsafe practice or condition.

4. Constant observation of the work procedures in order to detect and correct unsafe practices and conditions with the idea of developing improved methods of work.

5. Investigation and reporting of "no injury" or near accidents.

6. Full cooperation in gathering statistics for national organizations.

7. Holding cooperative safety meetings to train workmen and investigate employe suggestions on accidents.

THE EMPLOYE'S PART

IN many cases top management errs in attempting to dictate and force a top management safety program upon the employes. Field employes oftentimes are suspicious of such programs and are reluctant and only luke-warm in assisting to put such safety programs into actual practice.

As field employes usually represent from 85 to 90% of an operating company's personnel, the safety program should be 85 to 90% originated and composed by this major group of employes. Employes, under compulsion, may compliment your program in your presence, but in general, they are far more interested in their own originated ideas, so your job is to assist them in formulating and correlating their own safety program. Team work is needed in all successful operating plans. Teamwork is vital in making employes' safety programs effective.

In arriving at individual safety programs for separate operations, dealers should cover each general phase of activities conducted by other companies. In most operations these general phases are as follows:

A. Station Gas Handling

1. Tank car or transport truck unloading.

2. Cylinder or tank truck filling operations.

3. Maintenance and repair of pumps, piping, tanks, compressors, and other station units.

4. Fire extinguisher drills with actual manipulation and operation of each type of extinguisher.

B. Field Operations

1. Correct initial gas equipment installation (see all applicable provisions of NBFU Pamphlet No. 58).

2. Correct method of gas delivery to each type of customer-approved utilization equipment.

C. Approved Appliances

1. AGA approval requirements of appliances and a review of safe operation of each type of appliance with particular emphasis on the explanation of automatic controls and pilots and safety cut-offs.

D. Employe Operation of Automatic Units

1. Make sure by actual test men know how and why these safeguards operate.

E. General Safety Precautions

1. Handling tools.

2. Carrying and transporting equipment and appliances.

3. Use of first aid principles and first aid kits.

The manager directing each bulk plant should work with his field employes and have them submit the questions and data that they think should be included under each of the above mentioned phases of activities.

Give Men Time to Consider

Several days should be allowed for the men to study over what is applicable and submit their data to the manager. After these questions and ideas have been submitted, the plant manager should correlate all of them.

The plant manager should supplement the material supplied by his men with questions and data that will assure complete inclusion and understanding of the following important matters:

1. Study of properties and characteristics of the gas handled.

2. Review and questionnaire on applicable sections of NBFU Pamphlet No. 58, and the need for making installations in accordance with the provisions of this pamphlet.

3. Reasons for using properly approved equipment and accessories throughout all operations. Sub-standard equipment should never be used, as such usage may lead to accidents and unwarranted costs.

4. Discussion and reasons for connecting to AGA Testing Laboratories liquefied petroleum gas approved appliances.

5. Adequate periodic testing procedure for cylinders.

6. Adequate periodic testing procedure for safety relief valves, excess flow valves, and other special items on all station and tank truck equipment.

The review and checking of details of past accidents that may have occurred at each plant oftentimes assists the employes in formulating data and questions that will prevent recurrence of such accidents. These reviews prove very helpful in arriving at these programs. These above reviews should be of fact-finding nature rather than for the purpose of fixing blame on specific individuals.

Safety programs arrived at in this manner are really representative of the men who actually do the work and who are in a position to make the program effective in the field.

Should Have Safety Committee

Each bulk plant should have an employes' safety committee to assist in administering the safety program. One member of this committee should be selected by all the

employes to serve as chairman. It is advisable not to allow members to serve consecutive terms, as it is beneficial to rotate the membership so that all the field employes will have an opportunity to serve on this committee.

The committee should administer the plant's automotive safety plan, having meetings after each mishap and attempt to uncover all facts concerned, as well as the preventative measures that can be taken to avoid future automobile accidents. This committee should also investigate and make recommendations as to the cause of certain customer or employe accidents which the manager may designate as being worthy object lessons to be used in preventing recurrences of such type accidents.

Morning Meetings Are Best

A series of meetings should be scheduled at each plant periodically on company time to cover the employes' safety program. Most company programs will require from six to a dozen 2-hour meetings. Two-hour morning meetings, preferably during the middle of the week, are suggested at 2-week intervals, as experience has proven this interval of scheduling is very effective. Greater percentage attendance is possible and all are more alert in the morning. They absorb and retain far more information than in late evening or night meetings.

In conducting the safety meetings, the safety committee should assist the manager in preparing the data for the meeting as well as in conducting the meeting. Charts, model cars and trucks, blackboards and cut-away samples of valves and cylinders should be used to dramatize essential points. Employes not members of the committee should be assigned to conduct portions of the meeting.

Cover Essential Facts

It is not advisable to attempt to cover too much ground in one meeting. It is better to cover only such useful data as can be well absorbed and remembered. Make sure that adequate time is allowed to thoroughly drive home all essential points. Those conducting the different parts of each meeting should make ample preparation. These meetings are too important to be handicapped by lack of preparation.

Reviews, examinations and questionnaires should be used as follow-through on these meetings. At times, it is helpful to have these questionnaires answered in written form. It is essential that all cardinal safety instructions be understood by all employes. Care should be taken that meetings are scheduled at times when all employes can be in attendance. The office force as well as the field employes should attend these meetings, for safety regulations are applicable to all.

Many companies find it desirable to revise and repeat their entire series of safety meetings at least once a year and to devote time at every operation meeting to emphasize certain phases of the safety program.

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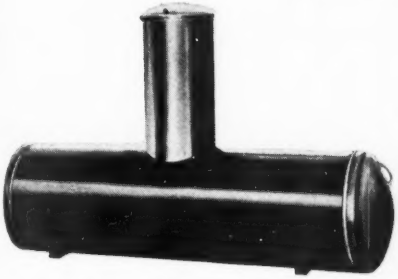

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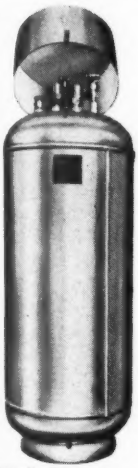

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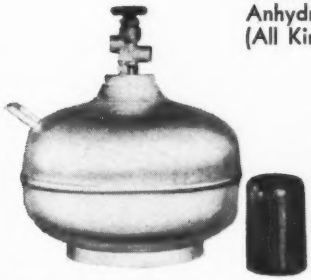

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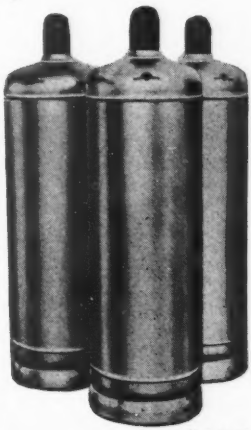

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QUALIFYING EMPLOYES

START THE NEW MAN RIGHT

THE first impression a new worker has of the LP-Gas company and its policy is likely to be a lasting one. A safety training program, therefore, should begin as early as possible. In some cases, the new employe finds safety an important part of the work the day he makes application for employment. This first impression is obtained by means of billboards carrying general safety information or by bulletin boards and posters in waiting rooms.

The dealer who interviews the applicant usually questions him about his previous safety record. This is not to reject him if his record is poor, but to impress him with the importance of safety on the new job.

The medical examination has been found of considerable value when it is thorough and complete. Perhaps the most common mistake in the industry is to send an applicant to the doctor for examination without informing the physician of the job or type of work expected of the applicant.

The examining physician has an excellent opportunity to instruct the applicant in personal safety habits and to point out the necessity of reporting all injuries, no matter how small. Workers usually respect the knowledge and judgment of a doctor and impressions made here may overcome prejudice and false ideas already formed.

Once the worker has met the preemployment requirements, his training becomes the major responsibility of his immediate superior or the LP-Gas dealer, himself.

The new man should be introduced to his fellow workers in a cordial manner and the dealer should make a special effort to explain the safety rules and practices. This gives the new man a chance to clear up any question or problem he may have concerning the work. The protective equipment provided by the company must be demonstrated and its use and care explained. The outstanding hazards of the job must be pointed out and the means of preventing accidents explained.

The introduction to the job and the initial instructions may require several days, during which time the new worker will require close or special supervision. This time

usually allows the dealer or plant manager to learn something of the worker's mental attitude and his personal life. Domestic difficulties, financial worries, poor morals, or bad personal habits all play a definite part in causing accidents. These facts often reveal themselves after the worker has been on the job a short time. The reliable dealer will use such knowledge when placing responsibility on the new man by knowing whether or not he is dependable, thorough, and intelligent.

Let Employe Do It

Once the dealer or supervisor has fairly well determined the new man's ability and limitations, he is prepared to observe his actions at work, use of tools and equipment, and cooperation with other workers. At this point any unsafe practice should be called to his attention and its fault explained, before demonstrating to him the correct and safe method. Once the foreman has told the worker the correct method, he should show him in detail why the practice is correct. This is to make a full impression upon the worker. After the explanation and demonstration, the foreman should ask the worker to re-enact the work or action as described. This is done to be sure the worker understands the method.

The foreman will find that his training may be permanently driven home if he will commend and compliment the man upon completion of a good job in a safe manner.

Numerous plants build their safety programs around an employe suggestion system. This system creates an incentive for workers to take a keen interest in their job and its efficient operation. This is especially true when rewards are offered for worthy suggestions.

New men have been very favorably impressed by the suggestion system, and actually devote more serious study to their job and ways and means of making it more profitable and easy. This provides excellent training for the new worker who immediately becomes interested to the extent that he asks questions, learns operations, and studies out improvements.

One of the most practical means of informing and training new employes is the use of safety signs. Numerous hazards are concealed or in disguise and the displaying of warning signs such as "No Smoking—Flammable Gases" informs and educates the new worker of hazardous areas. The proper use and application of safety signs at grind wheels, electrical equipment, and other points requires that the hazard and correction be named such as "Wear Goggles," "High Voltage," etc.

Use Signs Discreetly

The promiscuous use or improper location of signs defeats the purpose and careful consideration must be given to size, shape, and wording.

Not only is the new worker trained while on duty, but numerous methods are available whereby his education can be extended while off the job. The benefit derived from such training manifests itself

both at home and at work. A disabling injury takes the employe away from his work whether he be hurt at home, on the street, or at his job.

If the man has been impressed by the safety instructions he has received on the job, he will be receptive to outside training and willing to devote some of his own time and energy toward broadening his knowledge and improving his performance.

A most valuable means of outside training is periodic first-aid classes. Such classes are most often conducted at night over a period of a month or longer. New workers should be encouraged to enroll in these classes. The study of the care and attention required by accident victims instills a profound respect for the seriousness of small as well as critical injuries and creates a safety consciousness that may become a worthy personal habit.

Skilled first-aid instructors are usually available from the U.S. Bureau of Mines or the American Red Cross and a good part of the instructions incorporates ways and means of preventing accidents.

Indicate Approval

Satisfactory completion of the course entitles the student to a certificate or card and such training has a very specific value to the employe apart from the satisfaction he derives from being of service to his fellowmen.

In a number of states, vocational training courses are available in several phases of the oil and gas industries. These courses are instructed by competent and experienced personnel and are thorough and practicable. Such classes are usually held in nearby schools during evening hours and may meet as often as twice a week over a period of three months. Excellent results have been obtained from these courses in the petroleum industry series. Arrangements for obtaining these courses may be made by contacting the state department of vocational education.

Government Offers Course

The United States Department of Labor has prepared a course in industrial safety that has been widely presented through various colleges and trade schools. This course comprises 3-hr. sessions and may cover from 72 to 96 hours. Remarkable success was obtained with this course during the war years and it is still obtainable from the U.S. Department of Labor, Division of Labor Standards, Washington, D. C.

It has been accurately stated that man never ceases to learn and it is difficult, indeed, to determine where the new man ends and the trained man begins. As a matter of fact, all workers must be constantly trained as certainly as athletes must practice and actors rehearse in order to produce performances that are free from error.

A dealer taking the proper attitude toward safety training will promote the following reactions among his workers:

1. Proper attitude and appreciation of good work safely done.

2. Active participation in the company's safety program.

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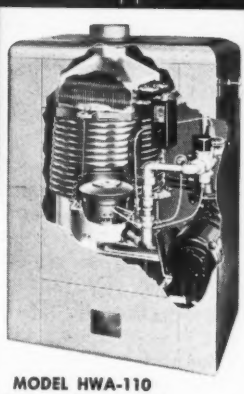

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3. Consideration of new workers as proteges; warning them of probable hazards and showing them safe ways and methods of handling LP-Gas.

4. Reporting promptly to his dealer unsafe practices and conditions which the worker cannot, himself, correct.

5. Reporting all accidents no matter how minor.

6. Keeping informed on the job.

7. Always reporting to work fit to perform duties by following temperate habits.

8. Cooperating with the dealer, fellow-workers and regular customers.

Safety contests not only maintain worker interest but they also encourage the exchange of safe practices information. Fellow workers become conscious of their responsibility toward one another and quite often accidents are prevented by calling attention to or correcting an unsafe act or physical hazard.

Such contests must always be conducted in a fair and impartial manner and rewards given with widespread recognition.

MAKE THE SAFETY MEETING CLICK

What are some of the good mechanics of conducting a snappy safety meeting?

1. Have a plan—establish your objective. Plan to meet your objective by the use of the tools available to you.

2. Stick to your subject. Have a plan and stay with it.

3. Be considerate and understanding of your conferees. If a question is presented and your plan has not contemplated such a question or reaction, don't delay—settle it at the time of presentation. Don't promise that you will get back to it and then forget it. If the question is premature, honestly advise your conferee that you will get to it—and live up to your promise.

In this connection, we would be remiss if we didn't mention—rapport. The psychologists have given us this term for harmonious relationship between individuals. Such a relationship, both mental and physical, is necessary for a true and accurate understanding. You might say the meeting is a selling endeavor with all sales resistance removed. In meetings there must be good rapport, both mental and physical.

4. Keep your props under cover. If you are going to show a chart, keep it under cover until you are ready to display it. If you don't, the boys will read it and get a partially baked idea of its meaning. Their attention is distracted and they may even build up objections to it. If they see it for the first time when you display it and interpret it, then they get your position first. The greatest value of such props is the element of surprise; and by keeping it under cover, it will serve its maximum usefulness to you.

5. Have everything ready. Don't pass out an item, such as a pamphlet, and ask the boys to pass it around while you are discussing it. The noise and the competition you set up for yourself certainly do not help you gain the attention of your conferees. If you want to pass out some material, make it a part of your meeting.

Give it to one of the men at the center of the conference table and make its distribution a part of your demonstration; or if you want to review some written material, have each man participate in the reading of the material. Don't send an assistant out in the audience to set up a projector while you go on with your phase of the meeting. Have your projector set up in advance, and your film tested and ready for immediate presentation. Make sure your room can be darkened for the proper display of visual aids by projection, adequately and promptly.

6. Make sure you have sufficient seating facilities, that the ventilation is good and outside interference is at a minimum. Make sure all physical arrangements are such as to contribute to your meetings, rather than have some such item in competition with you for attention of your conferees.

7. Don't depreciate. When you set out to do a demonstration, don't say, "I don't know whether or not this will explain my point." Don't announce, "These charts were made up for another purpose, and I am not sure that they will show you what I want." Don't start, "If you will bear with me—." If you have any doubts about the interest-worth of your material, how can you expect the audience to believe anything? If you feel it doesn't make the point, discard it, or use it without comment.

8. Place special exhibits at the back of the room. If you want the boys to examine models or parts after the meeting, put them at the back of the room near the exit. Don't put them up front for most of the boys want to run as soon as you are finished, anyway. And don't leave them back there unattended! Get back there quickly and call attention to them and answer questions about them.

9. Practice every demonstration. Never take a prop into a meeting until you have looked it over and know how it works, and know that you have mastered it. Never admit, "This is supposed to do so and so, but I never worked it before." If you have to demonstrate, practice until you have the demonstration letter perfect. Try it before a group only when you can make it look easy.

Ways to Get Results

In conclusion, if you want your meeting to click, establish your objective, and adopt a carefully laid plan of presentation to meet this objective. Balance your plan with judicious use of conference development, statistics, demonstrations and the visual aids. Make your presentations interesting, timely and orderly. Don't use stilted terms, be considerate and understanding and demonstrate an air of willingness to get the other fellow's point of view.

Be honest in your approach, lay your cards on the table, don't hedge. Be fair, state the problem accurately. Be firm in your position and sure you are supported by facts in such position. Make certain your conferees are in a harmonious state of mind for easy acceptance of your proposition. Recall "rapport" —make sure you have it, not only from the mental point of view, but from the physical as well. Create a desire for your product—"the accident-proof job" and demonstrate your sincerity of purpose by a well-planned, interesting and purposeful meeting. You'll get the results desired and the record will take care of itself.

DRIVER TRAINING

EQUALLY as important as the selection of well-designed and well-constructed transport equipment is the choice and proper training of drivers. To encourage safe delivery of LP-Gases to consumer installations, truck drivers are disciplined and educated on highway regulations and good practice.

Among active measures which should be taken is the selection of a supervisor to cooperate with drivers in developing care and discretion in operating transportation units. The LP-Gas dealer should appoint a responsible person in the organization to do this job, or take care of driver supervision himself.

Functions to be performed:

1. A regularly scheduled training and educational program on safe practices for drivers. Short, punchy safety meetings held once a week may be used to put over one or two accident-reducing points.

2. To correct causes of accidents, whether serious or not, they should be thoroughly investigated. Results are reported to LP-Gas drivers, so they can get full benefit of the information.

3. Schedule and route LP-Gas vehicles so as to avoid congested areas to minimize road hazards. The dealer or his supervisor should arrange deliveries to reduce truck movement through heavy traffic as much as possible.

4. Observations are made to determine if drivers are following instructions in the safe operation of vehicles and delivery of products. One irresponsible driver can nullify the entire effect of a well-conducted training program. Such checks are made periodically by the dealer or his appointed driver supervisor. They are just as important to safety as preventive maintenance inspection of vehicles.

Selection of Drivers

Before a bulk plant operator hires a driver, he investigates his past record. References are required, and as soon as possible after being employed, the driver is examined for the deficiencies listed below. They are attitudes recognized as major causes of accidents.

A. Poor discipline in operation of company vehicles:
   1. Disobedience of company rules.
   2. Susceptibility to interference by others.
   3. Horse-play.
   4. Drinking on the job.

B. Lack of concentration on job:
   1. Attention easily distracted.
   2. Inattention.

C. Unsafe practices:
   1. Chance taking.
   2. Hazardous short cuts.
   3. Haste.
   4. Poor judgment.

D. Mental unfitness:
   1. Sluggish or fatigued (reaction).
   2. Violent temper.
   3. Excitability.

E. Physical unfitness (a periodic check should be made of drivers to determine physical condition):
   1. Defective.
   2. Fatigued.
   3. Weak.

F. Lack of natural driving skill on the part of driver.

HERE ARE YOUR ANSWERS

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CODES

The LPGA model laws are guides for states and towns

THERE are codes or laws affecting all industries. These may be national in scope or apply only to the state, county, city or town in which operations occur. It is the intent of such laws to safeguard and control an industry's activities for (1) the welfare or protection of the public; (2) for protection of employes, management and property.

There are codes and laws affecting the LP-Gas industry, the most important of which are the regulations of the Interstate Commerce Commission relating to the transportation, filling, testing and handling of cylinders, and the standards of the National Board of Fire Underwriters, known as NBFU Pamphlet No. 58, and based upon the recommendations of the National Fire Protection Association.

The ICC rules (designated as Agent H. A. Campbell's Freight Tariff No. 4 and covering "Compressed Gases"), apply to interstate and intrastate movement of cylinders on railroads or trucks. Cylinders must be built to definite specifications to handle the normal pressures of propane gas, must be officially inspected and marked, and must be retested periodically. (See chapter herein on bottle filling and testing under "Bulk Plants.") Some of the highlights of these regulations and NBFU standards are set out in this chapter.

Safety regulations of ICC Bureau of Motor Carriers and Parts I to VI apply to truck transportation. Part VII contains tank truck specifications. ICC maintains that these regulations apply to private contract and common carriers engaged in interstate and intrastate commerce as well. While this last point may be highly controversial, no one has contested it in a court of competent jurisdiction.

Various states—about 36 in all—have adopted specific laws governing our industry or have empowered a state

official, as the fire marshal, to set up limited regulations. A number of municipalities and counties have done similarly. There is no national law, as such, except as already set out regarding the Interstate Commerce Commission.

Dealers and distributors should always make themselves conversant with all regulations affecting them. If in doubt, write to your state fire marshal or secretary of state.

Industry men, recognizing the wisdom of having fair laws to protect their own interests, and the public as well, have frequently conferred with law-making bodies in drafting proposed regulations so that those unacquainted with LP-Gas operations will not incorporate clauses unfair to either the industry or the public.

This effort to aid legislators and others has not always been fruitful because well outlined suggestions and sufficient influence were not brought to bear in time. Gradually it became apparent that, insomuch as law-makers as a whole could not be expected to have sufficient knowledge of the industry to frame wise rules, experienced industry men must make available what may be termed a model law from which they could work—one based upon complete knowledge of the characteristics of butane and propane and accepted practices in handling these fuels.

Thus was born the idea of drafting a basic model state law, one which was so eminently fair to the public that it would be acceptable to law-makers and so intelligently fair to the industry that operators would not be unduly handicapped.

This model state law was developed by the Liquefied Petroleum Gas Association and whenever it is known that LP-Gas legislation is pending in a state, the instrument is offered as a help and guide in framing a law. It is predicated upon ICC regulations, where they apply; upon NBFU Pamphlet No. 58 in large part, and upon sound safety practices grown out of wide experience. Serving such creditable ends, it has been widely adopted by states and has had much to do with avoiding the passage of too restrictive legislation.

Similarly, the LPGA has prepared a model municipal

Superior
LP-GAS VALVES, FITTINGS and ACCESSORIES

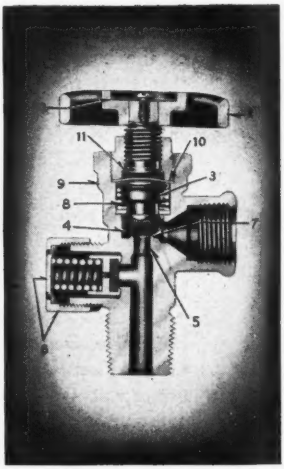
This new catalog illustrates and describes SUPERIOR cylinder valves. Also globe, line and angle valves—diaphragm packless and wing cap—in flare or sweat sizes; sight glasses, suitable for any normal LP-Gas pressure; and a complete line of LP-Gas Fittings and Accessories.

Write for Your Copy of Catalog LP-9 Today

CHECK THESE SUPERIOR FEATURES

1. Etched name and handwheel retainer plate
2. Octagon grip handwheel—easy to operate
3. Husky one-piece lower stem
4. Improved construction for locking seat securely
5. Generous opening permits rapid filling of cylinder
6. New, unique safety relief construction
7. Body seat design minimizes wear of vital parts
8. Strong spring assures positive valve opening
9. Sturdy forged brass body
10. Multiple metal diaphragm forms positive pressure seal
11. Metal-to-metal backseat when valve is fully opened

**Customer may specify special printing, and own trade name (special to order).*



Superior LP-Gas Cylinder Valves are listed as Standard and for Re-examination Service by Underwriters' Laboratories, Inc.

S48

Superior Valve and Fittings Co.

1509 WEST LIBERTY AVE., PITTSBURGH 26, PENNA.

OFFICES IN PRINCIPAL CITIES · STOCKS: CHICAGO (6) · LOS ANGELES (15) · JOBBERS EVERYWHERE

ordinance to aid towns and cities in setting up regulations governing the use of butane and propane.

These two model proposals are also made a part of this chapter on codes.

So far in this discussion, the codes and standards and model laws mentioned have applied only to cylinders, tanks, transports, systems and equipment concerned with the handling of butane and propane. Now in the process of formation is a proposed model code that will cover their utilization in household appliances—ranges, water heaters, refrigerators and space heating units. It is being developed by special committees appointed by the Liquefied Petroleum Gas Association and the Gas Appliance Manufacturers Association. It will be available soon to take its place alongside the model law and model ordinance in aiding law-makers in writing rules and regulations.

A MODEL LAW FOR STATES

AN ACT TO authorize the..... .....to prescribe uniform regulations in this State for safety in the design, construction, location, installation and operation of equipment for storing, handling, transporting by tank truck or tank trailer and utilizing liquefied petroleum gases for fuel purposes, and for the odorization of said gases used therewith; making a violation of this Act a misdemeanor and prescribing the penalty therefor; to provide for the marking of liquefied petroleum gas containers and to prohibit the refilling or use of such containers without authorization by the owner thereof; to prohibit the adoption by municipalities or other political subdivisions of ordinances or regulations in conflict with this Act.

BE IT ENACTED BY THE..... ....., STATE OF.....

Section 1. The term "Liquefied Petroleum Gas," as used in this Act, shall mean and include any material which is composed predominantly of any of the following hydrocarbons, or mixtures of the same: propane, propylene, butanes (normal butane or isobutane), and butylenes.

Section 2. The.....shall make, promulgate and enforce regulations setting forth minimum general standards covering the design, construction, location, installation and operation of equipment for storing, handling, transporting by tank truck, tank trailer, and utilizing liquefied petroleum gases and specifying the

odorization of said gases and the degree thereof. Said regulations shall be such as are reasonably necessary for the protection of the health, welfare and safety of the public and persons using such materials, and shall be in substantial conformity with the generally accepted standards of safety concerning the same subject matter. Such regulations shall be adopted by the.....only after a public hearing thereon.

It is hereby declared that regulations in substantial conformity with the published standards of the National Board of Fire Underwriters for the design, installation and construction of containers and pertinent equipment for the storage and handling of liquefied petroleum gases as recommended by the National Fire Protection Association shall be deemed to be in substantial conformity with the generally accepted standards of safety concerning the same subject matter.

Section 3. No person, firm or corporation, other than the owner and those authorized by the owner so to do, shall sell, fill, refill, deliver or permit to be delivered, or use in any manner any liquefied petroleum gas container or receptacle for any gas, compound, or for any other purpose whatsoever.

Section 4. It shall be unlawful for any person, firm, association, or corporation, on and after the effective date of this Act to violate any of the provisions hereof or of the regulations of the.....made pursuant hereto. Any person, firm, association, or corporation violating any of the provisions of this Act, or said regulations made hereunder shall be deemed guilty of a misdemeanor, and, upon conviction thereof, shall be punished by a fine of not more than..... .....dollars ($.....).

Section 5. No municipality or other political subdivision shall adopt or enforce any ordinance or regulation in conflict with the provisions of this Act or with the regulations promulgated under Section 2 of this Act.

Section 6. The.....hereby finds, determines and declares that this Act is necessary for the immediate preservation of the public peace, health and safety.

Section 7. This Act shall become effective.....

A MODEL MUNICIPAL ORDINANCE

Title

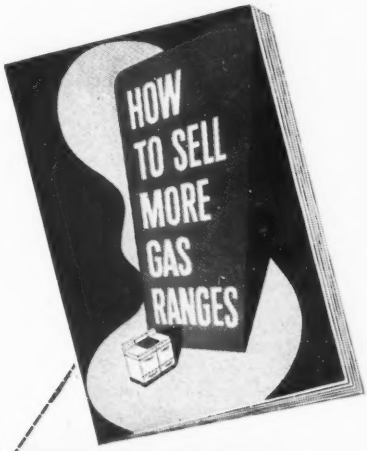
An ordinance for safeguarding persons and property and promoting the welfare of the public; establishing standards for liquefied petroleum gas equipment; providing penalties for the violation of this ordinance and repealing all ordinances and parts of ordinances in conflict with this ordinance.

The (governing body) of the City of.....ordains as follows:

Section 1—Definition of Liquefied Petroleum Gas

The term "liquefied petroleum gas" as used in this ordinance, shall mean and include any material which is composed predominantly of any of the following hydrocarbons, or mixtures of them: propane, propylene, butanes (normal butane or isobutane), and butylenes.

Two booklets that sell ranges equipped with HARPER CENTER SIMMER BURNERS



FOR YOUR PROSPECTS!

This booklet, "Modern Methods of Top Burner Cooking," is being widely distributed to housewives. It describes the superiority of the Harper Center Simmer Burner... that it makes possible fuel savings up to 39%, eliminates guesswork in cooking, saves pot-watching, keeps kitchens cooler, provides proper pressure cooker heat, offers more healthful, less wasteful cooking... provides the true "keep warm" heat that keeps foods at serving temperature *without further cooking*. The booklet is offered to housewives in advertisements appearing in leading national publications read regularly by over 21,500,000 women.

FOR YOUR SALESMEN!

This booklet illustrates ways to *demonstrate* advantages of the Harper Center Simmer top burners to prospects. "How to Sell More Gas Ranges" contains scores of helpful pointers on how to make dramatic, effective sales-floor demonstrations... the sure way to close sales of higher-priced ranges. We shall be glad to send FREE copies for your sales staff. Write Harper-Wyman Company, 8563 Vincennes Avenue, Chicago 20, Illinois.

The Harper Center Simmer Burner operates on the unique principle of "2 burners in 1"... a STARTING BURNER for frying and to start foods boiling, plus a small, economical CENTER SIMMER BURNER, to maintain the cooking... both controlled by the same handle. It is subject to finer gradations of low heats—greater control and economy—than any other top burner made.

HARPER CENTER SIMMER BURNERS

"...Holds the Lines for Gas"

HARPER CENTER SIMMER

Section 2—Application of Provisions of This Ordinance

(a) The term "liquefied petroleum gas equipment" as herein referred to shall be construed to embrace all devices, piping and equipment pertinent to the use of liquefied petroleum gas, except gas-burning appliances.

(b) The term "appliances" as herein referred to shall be construed to embrace all gas-burning appliances intended for use with liquefied petroleum gas.

Section 3—Standards for Liquefied Petroleum Gas Equipment and Its Installation

All installations of liquefied petroleum gas equipment shall be in conformity with the provisions of this ordinance, with the statutes of the State of.....and with any orders, rules or regulations issued by authority thereof and with generally recognized standards for safety to persons and property. Where no specific standards are prescribed by this ordinance or by the statutes of the State of.....or by any orders, rules or regulations issued by authority thereof, conformity with the Standards of the National Board of Fire Underwriters for the Design, Installation and Construction of Containers and Pertinent Equipment for the Storage and Handling of Liquefied Petroleum Gases as recommended by the National Fire Protection Association (Pamphlet No. 58) shall be prima facie evidence of conformity with generally recognized standards for safety to persons and property.

Section 4—Record of Installations

Every person, firm or corporation installing liquefied petroleum gas equipment, other than gas-burning appliances and replacing of portable cylinders, in.....shall keep a record of each installation, showing the name and address of the customer at whose place the liquefied petroleum gas equipment has been installed and the date of the installation, and shall disclose such record to.....at any time, upon his request, during regular business hours.

Section 5—Inspection of Installations

The.....shall inspect a reasonable number of installations of liquefied petroleum gas equipment.

Section 6—Plants Devoted to Filling Containers

In addition to the foregoing provision, plants devoted to filling liquefied petroleum gas containers shall comply with the following requirements, except office buildings and other buildings or structures on the same property which are not used for

State Laws Compiled

Thirty-six of the 48 states have regulations or laws governing butane and propane operations. Others will pass legislation in the course of time. Do you know what existing laws require of you?

The monumental task of assembling and printing the state laws has been completed by the National Butane-Propane Association and gathered into one book.

The compilation is an important contribution to industry information. Arranged alphabetically by states, and including the provinces of Canada, the compilation will be especially valuable to manufacturers and distributors operating in several states as there are often important differences in various statutes.—Editor.

filling containers or other similar operations:

(a) In no case shall any plant storage tank be located closer than 50 feet from any building not physically connected with the plant, or to any line of adjoining property which may be built upon.

(b) Artificial lighting shall be restricted to electricity. In buildings or portions of buildings containing liquefied petroleum gas storage containers, and in buildings or portions of buildings where cylinders or tank trucks are filled, all electrical equipment for light and power shall be in compliance with the requirements of the National Electrical Code for Class I, Group D, Hazardous locations; heating shall be by steam, hot water, or hot air with heating units located in a separate building provided for this purpose, or in a separate room cut off from all other portions of the building by vapor-tight fire resistant walls and with entrance from the outside.

Section 7—Tank Trucks

Tank trucks used in the distribution of liquefied petroleum gas shall conform to provisions set out in Section 3 of this ordinance.

Section 8—Penalties

Any person, firm or corporation who shall violate any of the provisions of this ordinance and who, after notice from..... shall fail to correct any incorrect installations within twenty (20) days after receiving such notice, shall be guilty of a misdemeanor and upon conviction thereof shall be punished by a fine of not less than.....dollars or more than..... dollars for each offense, including costs of prosecution, and in default thereof by imprisonment for not less than.....days nor more than...days.

Section 9—Validity

If any section, sub-section, sentence, clause or phrase of this ordinance is for any reason held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this ordinance. The (governing body) of.....hereby declares that it would have passed this ordinance and each section, sub-section, sentence, clause or phrase thereof, irrespective of the fact that any one or more sections, sub-sections, sentences, clauses or phrases be declared unconstitutional.

Section 10—Repeal of Conflicting Ordinances

All ordinances or parts of ordinances conflicting with the provisions of this ordinance are hereby repealed.

Section 11—Date to Take Effect

This ordinance shall take effect... days after its passage and publication.

THE INDUSTRY IS ORGANIZED FOR SAFETY

SAFETY and good operating practices go hand-in-hand in the LP-Gas industry. Operators and employes cannot be efficient unless they know how to properly install and service systems and appliances and an understanding of the characteristics of the fuel they handle is imperative to attain a high degree of safety in their installations.

That the industry is becoming increasingly aware of this fact is evidenced by the establishment of many service-instruction courses by various organizations. Several state

Domestic gas range section, Pacific Coast branch, AGA Testing Laboratories.

associations have inaugurated annual short-training classes, one holding monthly meetings throughout the year; some manufacturers are conducting field schools at which attendants are taught how to expertly and safely operate various products; the Liquefied Petroleum Gas Association is arranging for short courses in seven sections of the country to be operated in conjunction with university extension courses; the L-P Gas Institute, of Tulsa, Okla., provides a four-months' complete instruction course in the rudiments of practice and safety for beginners and a 30-day course for those who have some knowledge of the industry; the University of Tulsa has provided an annual short course for several years past, and at least two Texas institutions do likewise. The U. S. Bureau of Mines conducts numerous safety demonstrations.

The Texas Butane Dealers Association sends a crew of experts over the state which holds safety meetings, open to all industrymen, in numerous districts. And the LPGA has a safety engineer whose principal work is to travel over the country to advise dealers on safe operating practices and investigate causes of any accidents that occur.

This practice of conducting service and safety schools is certain to spread until there becomes easily available to dealers in every locality opportunity to study the fundamentals of the LP-Gas industry in order to attain the highest safety.

Contributing vitally to safety in the industry is the Underwriters Laboratories, Inc., Chicago, sponsored by the National Board of Fire Underwriters. This organization tests LP-Gas equipment, placing its approval upon that which passes inspection, and this approval is a guarantee of proper design.

The American Gas Association Testing Laboratories perform the same function for appliances as the Underwriters Laboratories do for equipment. It tests ranges, water heaters, refrigerators, and heating units for proper design and efficiency for use with liquefied petroleum gas and issues a seal of approval for those appliances meeting required standards.

ACKNOWLEDGMENTS

THE preparation of this Safe Practices issue of BUTANE-PROPANE *News* has been based upon generally accepted procedures followed by the LP-Gas industry for many years. The greater part of the material has appeared in print heretofore—in this magazine, the Handbook Butane-Propane Gases, The Bottled Gas Manual, bulletins of large operators and in papers prepared by experts in particular fields.

In drawing upon these sources for editorial material and pictures, we wish to express our obligation to innumerable individuals and companies. A few have contributed additionally either by supplying specific help or in reviewing part or all of the safety text and to these, whose names follow, we make particular, additional acknowledgment:

Harold W. Wickstrom, Consulting Engineer
Franklin R. Featherston, Vice President, Liquefied Petroleum Gas Association
S. D. Clithero, General Petroleum Corp.
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F. T. Carpenter, United Petroleum Gas Co.
C. H. Van Marter, Union Oil Co.
George R. Benz, Phillips Petroleum Co.
Rex V. Phelps, Warren Petroleum Corp.
E. M. McEneany, Diablo Co.
Charles F. S. Ryan, Charles, Ryan & Rivers, Inc.
National Butane-Propane Association
Smith Precision Products Co.
Standard Oil Company of California
Western Fire Protection, Inc.

ASSOCIATIONS

NBPA

The next meeting place for the NBPA board of directors has been definitely set for the Roosevelt hotel, New Orleans. Arrangements have been completed by Elwin E. Hadlick, executive vice president to hold the session July 12-13.

Plans for the third annual NBPA convention and trade exhibit scheduled for the Congress hotel, Chicago, Sept, 20-22, are the top item on the agenda for the directors.

Because of limited hotel accommodation in New Orleans, the directors are being asked to get in touch with the association offices, 842 Builders Exchange, Minneapolis 2, so it will be possible to double up on available rooms.

The National Butane-Propane Assn. has recently compiled the constitutions, articles of incorporation, bylaws, and applications for memberships of all associations tied into the liquefied petroleum gas industry. These include the constitution and bylaws of the National Butane-Propane Assn. itself.

This comprehensive compilation, which is largely for reference for other groups contemplating similar organization, follows shortly after the assemblage of laws and regulations governing the LP-Gas industry appearing upon the books of the various states which have passed this kind of legislation.

The special significance of the compilation of association bylaws lies in the fact that between two covers any group of LP-Gas men can find the combined thoughts of many state groups who have labored to prepare the most workable organizational plans for their respective associations and these will serve as a pattern upon which to build other associaitons.

Council of State Associations

Election of new officers and discussion of various projects being developed were items of business transacted at the spring meeting of the Council of LP-Gas Associations May 1 at the Georgian Terrace hotel, Atlanta, Ga.

WM. J. LAWSON

Delegates to the council meeting also took part in the program at the joint Alabama-Georgia association gathering May 3-4 in nearby Columbus.

A. W. Porter, Little Rock, Ark., became the new chairman of the council in the election. He will be assisted by Fred A. Rives, retiring president of the Georgia LP-Gas Assn., as vice chairman.

Elected by acclamation to the post of secretary was Robert W. Hadlick, also executive secretary of Missouri LP-Gas Assn.

Retiring Chairman William J. Lawson, who has led the council through its first year's accomplishments, stated

that all officers automatically become members of the executive committee. Other members elected to the committee were Mr. Lawson, R. H. Mahnke, Kansas, retiring vice chairman of the council and M. L. Trotter, Carolina Butane Gas Co., Inc., Columbia, S. C.

One of the most important reports was Howard White's on negotiations with the American Gas Assn. about employing references to L P - G a s in AGA's vast advertising program.

R. T. Curtis, Ross-Martin Co., Tulsa, presented a brochure on the printed forms offered by his company to the LP-Gas industry. The council unanimously a p p r o v e d and endorsed the Ross-Martin Co. forms.

Other business was a brief report by Vernon Beals on the association-sponsored advertising p r o g r a m prepared by his c o m p a n y. The total volume was approximately $150,000, as of April 30, he stated.

LP-Gas men in attendance, other than mentioned above, were James L. Bradley, executive vice president of Colorado LP-Gas Assn.; R. H. Stinger, Michigan LP-Gas Assn.; Frank de-Gruy, president, A l a b a m a LP-Gas Assn.; Emile O. Lewis, H e r m a n n Paris, and C. A. Perry, Georgia Automatic Gas Co., Atlanta; P. M. Nightengale, Ideal Gas Inc., Savannah; J. E. Price, Southeastern N a t u r a l Gas Corp., Miami, Fla.; J. W. Roark and W. P. V o g e l s a n g, Skelly Oil Co., Kansas City; S i d n e y L. Stapleton, s e c r e t a r y, Georgia LP-Gas Assn., and J. P. Ward, director, Georgia LP-Gas Assn.

Canadian District

It is the intention of District 8, LPGA, Canadian Section, to cooperate with the Canadian Standards Association in the setting up of the proper safety rules and regulations and to use the offices and facilities of the CSA to formulate safe and

Newly elected officers of the Council of LP-Gas Associations. Left to right: Robert Hadlick, A. W. Porter, and Fred Rives.

AT THE CROSS ROADS OF THE CONTINENT

CHICAGO

CONGRESS HOTEL
SEPTEMBER 20, 21 and 22

NBPA's

ANNUAL CONVENTION
AND TRADE EXHIBIT

DEALERS, DISTRIBUTORS

In Chicago you will meet other marketers of butane and propane gases who operate bulk plants. You will be able to exchange ideas, hear talks on important current topics, see the latest in accessories, appliances and equipment, and further your friendship with other operators who have problems similar to yours.

MANUFACTURERS

If you manufacture or distribute butane and propane accessories, appliances and equipment . . . display space at the trade show will give you an opportunity to display your wares to a concentrated audience of bulk plant operators . . . representatives of the largest buying group in the industry, and your representatives to the consumers.

DESIRABLE DISPLAY SPACE NOW AVAILABLE

Write for

EXHIBIT SPACE, to NBPA for full details

PROGRAM ADVERTISING, to NBPA for information

ROOM RESERVATIONS, to the Congress Hotel, Chicago, Ill. Make your reservations early . . . specify arrival and departure time, and type of accommodations desired . . . and ask for a written confirmation

NATIONAL BUTANE-PROPANE ASSOCIATION

842 Builders Exchange — Minneapolis 2, Minn.

sound operating practices throughout the industry. This work will be coordinated through the Technical and Standards committee. Upon establishment of a proper code and regulations it will be the further responsibility of the committee to present the same to the proper legislative bodies and authorities as a guide to suitable legislation covering the Canadian industry and the Canadian public as a whole.

Among members of the industry who attended the March 23-24 convention in Toronto were: Howard L. Dunn, Canadian Propogas Co., Ltd., Montreal; S. Alfred Painter, Canadian Propogas Co., Ltd., Montreal; Don Thorburn, Salem Engineering, Hamilton; Bill Gallagher, Moffats, Ltd., Toronto; Jim M. Moffat, Moffats, Ltd., Weston; Chick M. Murray, C. M. Murray, Ltd., London, Ont.; Jack E. Gilson, Empire Brass Mfg. Co., Ltd., Toronto; Bruce Blizzard, Imperial Oil, Ltd., Toronto; Stew Coxford, Beach Foundry, Ltd., Ottawa; Ed. W. Sanderson, Petrolane Corp., Ltd., Thornhill; Rex S. Hickey, Imperial Oil, Ltd., Toronto; Mel Forrester, Gurney Foundry Co., Ltd., Toronto; William T. Wyatt, Sewel, Canada, Ltd., Toronto; A. Del. Palmer, Sturdie Propane, Ltd., Lethbridge; Edward C. Town, Claire Bros. & Co., Ltd., Preston; Dave McWilliams, Dresser Mfg. Co., Ltd., Toronto; William K. White, Findleys, Ltd., Carleton Pl., Toronto; Dr. William D. Walters, Victory Developments, Ltd., Owen Sound; Grant Marsh, Toronto Hardware Mfg. Co., Ltd.; Ken Cheetham, Shell Oil Co., Ltd., Toronto.

State Associations

SEWARD ABBOTT

T. H. ANDERSON

Colorado

Pleasure took precedence over business at the May 22-24 spring meeting of the Colorado LP-Gas Assn. in Glenwood Springs, but the Colorado dealers showed plenty of interest in the talks that were presented. G. B. Gellinger was in charge of arrangements.

Speakers were E. L. Scott, who discussed insurance; L. J. Wilmeth, sales manager, Shamrock Oil & Gas Corp., Amarillo; Seward Abbott, Servel Inc., W. J. Montgomery, Beals Creative Printers, Oklahoma City, and G. B. Buck, vice president and merchandise manager, Public Service Co. of Colorado.

T. H. Anderson, Denver Skelgas Service, served as moderator for an open forum on problems facing Colorado dealers.

The next meeting of the association, which also includes a trade show, will be held at the Shirley Savoy hotel, Denver, Sept. 26-28. It is the annual Colorado fall convention.

J. V. PRATT

R. H. MAHNKE

Kansas

More than 300 industrymen attended the third annual convention and trade exhibit of the Kansas LP-Gas Assn. held in Wichita, April 21-22, according to R. H. Mahnke, executive secretary of the association.

Sales talks, including an inspirational message by Ralph Carney, vice president and sales manager, The Coleman Co., held top priority on the program. Jim Pratt, president of the association, and Glen Humburg, vice president, presided over the sessions.

An unusual presentation was a "report from the field" prepared by a group of representatives chairmanned by George McClellan, Salina. Each representative gave a brief report on the fuel supply situation.

Those participating were Jim Jasper, Dighton; Jim Emery, Garden City; Glen Humberg, La Crosse; George Grimes, Ashland; Clyde Cheatum, Wichita, and A. C. Ferrell, Atchison.

Speakers who stressed selling were C. A. Spiegel, Servel Inc.; Marshall Massey, Ross-Martin Co., Tulsa, and even John Knox Smith, field engineer, LPGA, who spoke on "Selling with Safety."

Georgia

Sidney Stapleton, Atlanta, is the newly elected president of the Georgia LP-Gas Assn. He succeeds Fred Rives, who was named vice chairman of the Council of LP-Gas Associations, at a meeting of the Georgia association in Columbus, May 3-4.

Election of officers climaxed activities in a two-day joint session of the Georgia-Alabama LP-Gas associations. The Alabama dealers were guests at the Georgia session.

Mr. Stapleton, the new president, is vice president of the Georgia Automatic and Georgia Butane Gas Companies. Mr. Rives is president of the Automatic Gas Co., Columbus.

Other officers elected are Ben Cain, vice president, of Griffin, Ga., Charley Olliff, secretary-treasurer, Statesboro, and P. M. Nightengale, elected to the board of directors, Savannah.

May Employ Secretary

Featuring a number of speakers, the business session agenda also included the appointment of a committee to investigate the possibility of employing a full-time, paid secretary for the association.

As well as Pete Vinet, who filled in for E. Carl Sorby of Geo. D. Roper Corp. on the program, speakers were R. H. Stinger of the Michigan LP-Gas Assn.; William J. Lawson, executive secretary of the Texas Butane Dealers Assn.; Howard White, executive vice president of the LPGA, and Vernon Beals, Beals Creative Printers, Oklahoma City.

R. H. Wherry, sales engineer, Gas Equipment Supply Co., discussed "Safety and Operating Equipment" for the dealers.

A demonstration of fire fighting equipment, with an explanation by C. B. DeBerry Jr., Southeastern Fire Extinguisher sales, Atlanta, closed the program.

General committee, Southwest LP-Gas Convention and Trade Show (seated): Charles Monroe, Jr., general chairman; (standing, left to right): J. Lewis Bretz; Fred L. Yates, secretary, and C. O. Whisnand, president, Oklahoma LP-Gas Assn.; J. L. Grigsby; Bill Alexander; and Forrest Smith. Francis J. Borelli, committee member, not present.

Oklahoma

Special informational talks and discussions to help LP-Gas dealers will feature the two concluding days of the Southwest LP-Gas Convention and Trade Show, at the Skirvin hotel Oklahoma City, Okla., Sept. 12-14.

Preview of general subjects for these days, announced by Fred L. Yates, executive secretary, Oklahoma LP-Gas Association, which sponsors the show, includes "Present and Future Demands for LP-Gas"; "Future Supply"; "Cooperating with LP-Gas Dealers"; "Future of Butane and Propane"; "Retailing LP-Gas"; "Business Practices"; "Handling LP-Gas," and "Maintenance of Regulators and Valves."

Emphasis on the opening day will be laid on visiting the exhibits. Chas. Monroe, Jr., Perry, Okla., is general chairman for the convention and trade show.

CNGA

ED. MILLETT

Sports activities head the program for the annual frolic of the California Natural Gasoline Assn., scheduled for all day and evening, June 5, at the Rio Hondo Golf club, Downey, Calif.

The mammoth sports fiesta including golf, baseball, horseshoes, volleyball, and paddle tennis will be supplemented with a barbecue and a variety show.

F. J. Colton, CNGA president, points out that the affair is open to all friends of the association. Reservations and tickets may be had from Secretary Ed Millett, 510 West 6 St., Los Angeles.

Texas

With more than 500 LP-Gas men expected to put in an appearance, the Texas Butane Dealers Assn. is preparing a brisk program for its third annual convention and trade show, June 28-30, in Austin, according to William J. Lawson, executive secretary.

GUS MOOS

The agenda includes addresses by Ralph W. Carney, vice president of The Coleman Co.; Arthur D. Briese, Arkansas humorist, Wm. J. Murray, Texas Railroad Commission, and Col. Ike Ashburn, executive vice president of the Texas Good Roads Assn.

Other featured speakers are Beauford H. Jester, governor of Texas; Charlie Giezendanner, Giezendanner's Advertising agency, Houston, who will talk on "Public Relations"; Plasco G. Moore, assistant state director of vocational education, and Gus Moos, president of TBDA.

Among subjects scheduled for discussion are a "Larger Tank Program," "The Incentive Type Safety Program," "Insurance," and "What's It Going to Be—Butane or Propane?"

Booths for exhibitors, expected to be close to 50 in number, are to be located on the mezzanine floor of the Driskill hotel. The Austin hotel will also serve as headquarters for the convention.

•

Truman Adkins, of Grand Saline, Texas, has joined the butane service schools of the Texas Butane Dealers Assn. as its third training director. The other two are Olen Grounds and Orrin Morgan, both of Arlington, Texas.

The course, open to individuals employed in the LP-Gas industry, is designed to help increase sales through improved service, and to increase customer confidence through better installations. After an employe takes the course he is apt to be a better-trained, safety-minded man.

The course was originated and launched by the TBDA in cooperation with the Industrial and Business Extension Training at the University of Texas and the State Board for Vocational Education.

•

A three-point safety program sponsored by the Texas Butane Dealers Assn. was scheduled to get under way in May, according to Wm. J. Lawson, executive secretary of the association.

One of the most important parts of the program will be the employes' safety contest, built around three different groups. Gene Bumpus, of Plainview, is chairman of the committee to plan the contest.

A safe practices manual will be written by members of another committee, headed by W. E. Fraley, of Abilene. The booklet will contain minimum safety standards as a guide for the industry.

Ludwig Sauer, of Seguin, is chairman of the committee for the LP-Gas appliance school which will be held at A&M College in College Station, Texas, during August.

The safety contest is planned around three groups: transport drivers, fuel truck operators, and service and installation men.

Drivers will be gauged on a mileage basis, truck operators will be judged on their operations for each six months, regardless of miles operated, and the last group will operate

TO GET *Your Share*

OF COMMERCIAL COOKING,
RECOMMEND AND INSTALL

BLODGETT

Higgins Aircraft Corp., New Orleans, La.

MORE THAN 200,000 public feeding operations of all classes are "off-the-mains" and their average gas consumption is equivalent to 20 domestic installations! • Blodgett Baking and Roasting Ovens are designed to get and hold that business for you, in the smallest places or the largest. There are twenty-two models, designed to fit every need, backed by comprehensive consumer advertising and publicity—plus literature designed to help you recommend and sell.

Send for that literature now!

THE G. S. BLODGETT CO., INC.

50 LAKESIDE AVENUE, BURLINGTON, VERMONT

BLODGETT — Makers of Fine Ovens Since 1848

One Commercial Cooking Job Equals 20 Domestic Cooking Jobs!

as teams. Awards to service and installation men will be made in the name of the firm, with each team member receiving recognition for his part.

•

A short course for service men, sponsored by the Texas Butane Dealers Assn., will be held at A&M College in College Station, Texas, in August.

The most modern and correct methods on the installation and servicing of LP-Gas appliances will be taught. Factory representatives from various appliance manufacturers will be the instructors.

Directly in charge of the school is E. L. Williams, director of the college's industrial extension service.

The enrolled employes will attend classes eight hours a day for the five days of the course.

Sales and Safety Schools Will Aid Oklahoma Dealers

A sales school to teach advantages of LP-Gas and appliances opened at Seminole, Okla., on the night of May 11, and was scheduled to be repeated at several other strategic points in the state in May and June, Fred L. Yates, executive secretary, Oklahoma LP-Gas Association, announces.

The classes are being held in all sections of the state.

D. R. Wood, formerly employed with a natural gas company and for many years a teacher of the principles of retail selling, is conducting the classes. As its principal text, the school takes the publication, "Selling Gas Appliances," which was put out by the Southern Gas Association and which has been revised to fit the LP-Gas business.

The school is being put on by the Oklahoma state board of vocational education and sponsored by the Oklahoma LP-Gas Assn. Most of the LP-Gas men of Oklahoma sell both gas and appliances and it is to help these particularly, and their employes, in their selling of appliances and equipment that the course was planned.

The Oklahoma association also has arranged a one-day truck drivers' clinic for Oklahoma City on Aug. 24. Its chief purpose will be the promotion of greater safety among LP-Gas truck drivers. Awards for best safety records will be presented to drivers by John Knox Smith, engineer of the Liquefied Petroleum Gas Assn.

The U. S. Bureau of Mines puts on safety and fire fighting demonstrations during the meetings.

CALENDAR

June 27-29—Arkansas Butane Dealers Assn. Little Rock.

June 27-30—Texas Butane Dealers Association. Stephen F. Austin and Driskill Hotels, Austin, Texas.

June 28—Michigan Liquefied Petroleum Gas Association. Ramona Park Hotel. Harbor Springs, Mich.

July 12-13—National Butane-Propane Assn. Board of Directors. Roosevelt Hotel. New Orleans, La.

Aug. 17-18—New Mexico Liquefied Petroleum Gas Assn. Hilton Hotel. Albuquerque, N. M.

Aug. 30-31—Tennessee Liquefied Petroleum Gas Assn. Andrew Jackson Hotel. Nashville, Tenn.

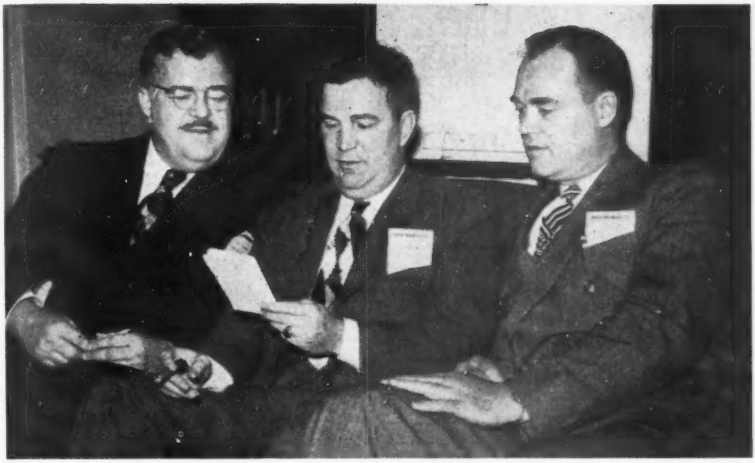
Sept. 12-14—Southwestern Annual Convention and Trade Show, Oklahoma LP-Gas Assn. Skirvin Hotel. Oklahoma City.

Sept. 16-18—National Petroleum Association. Atlantic City, N. J.

Sept. 20-22—National Butane-Propane Association, National Convention and Trade Show. Congress Hotel, Chicago.

Sept. 26-28—Colorado Liquefied Petroleum Gas Association Annual Meeting and Trade Show. Shirley-Savoy Hotel. Denver.

Oct. 4—AGA Convention and GAMA Exhibition. Atlantic City, N. J.



Officers of Rapid Thermogas Co., operating in Iowa, Illinois, and Wisconsin: R. L. Buckingham, vice president; Charles Russell, president; and Verne Mueller, vice president.

Rapid Thermogas Holds Meet For 200 Midwest Dealers

A large dealer meeting and party was held on April 25-26 at Cedar Rapids, Iowa, by the Rapid Thermogas Co. Dealers assembled at the Roosevelt hotel from all over Wisconsin, Iowa, and Illinois.

More than 200 attended the meeting, according to R. L. Buckingham, vice president of the company.

"Better Selling" was the keynote of the session. Among those presenting papers and giving talks were John Pankow, Detroit-Michigan Stove Co., and Elmer Cone, Ruud Water Heater Co., Kansas City.

A banquet and stage show climaxed the two-day meeting. Many outstanding personalities of the LP-Gas industry were present. Among the companies represented at this meeting were Bastian-Blessing Co., Pressed Steel Tank Co., Moore Corp., Geo. D. Roper Corp., Standard Gas & Equipment Co., American Stove Co., Florence Stove Co., Detroit-Michigan Stove Co., Hudson Manufacturing Co., and Johnson Gas Appliance Co.

"We feel it was a successful meeting," stated Charles Russell, president of Rapid Thermogas. "Our dealer organization of nearly 1000 needed just such a stirring experience to gear them for the hard selling period just ahead."

Louis Katz, Eastern Gas Man, Made Company Vice President

Louis A. Katz has recently been elevated to the position of vice president in charge of operations for Natural Gas Co., Hammonton, N. J., according to Marvin B. Glickman, president. Katz has been associated with the company for the past two years.

PRODUCTS

Dry Chemical Extinguisher

Ansul Chemical Co., Fire Extinguisher Div., Marinette, Wis.

Model: Ansul 20 and 30.

Application: Ansul 20 and Ansul 30 portable dry chemical fire extinguishers, according to their manufacturer, are recommended effective fire protection for LP-Gas tank trucks, pumping and transfer stations, loading docks, etc.

Description: These extinguishers have a capacity of 20 and 30 lbs. of Ansul "Plus-Fifty" dry chemical, respectively, and the total charged weights are 38½ lbs. for the Ansul 20 and 56½ lbs. for the Ansul 30. Aluminum alloy, truck-type, mounting brackets for mounting horizontally or vertically are available. It is claimed these extinguishers are highly effective in combating butane and propane fires under high pressure.

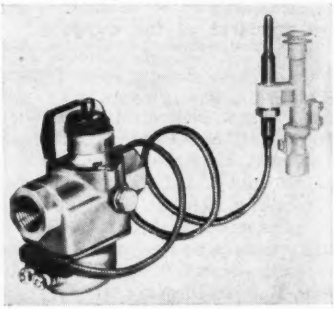
Positive Shutoff

General Controls Co., 801 Allen Ave., Glendale, Calif.

Model. MR-2-5.

Application: Designed particularly for floor, central, small space heaters, and water heaters operating on LP-Gas, natural, manufactured and mixed gases.

Description: This is an all-in-one simplified, on-off and safety shutoff control unit which automatically stops flow of all gas when the pilot is extinguished. During the reset operation, gas flows to the pilot burner only; no gas can pass to main burner until the pilot is ignited and the safety valve set in operating position. The single handle control is then set for any desired gas flow to the main



burner. The handle is designed to permit setting of the safety valve without moving the gas cock from the closed position.

It is impossible for the pilot gas to remain on should the handle be left in the off or reset position without pilot ignition being established. The operating mechanism is protected by a complete seal against air-borne or gas-borne foreign matter or scum-forming vapors, and it is double-sealed against gas leakage to the atmosphere. Accessible thermocouple terminals permit check of couple or valve operation under normal operating conditions and without breaking connections.

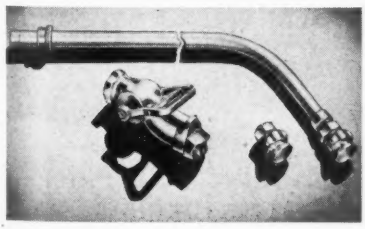
Fog Nozzle

Western Fire Protection Inc., 611 E. 3rd St., Los Angeles.

Model: Combination Firemaster Type C.

Application: Ideal for use on water lines where 75 lbs. pressure or over is required. Smaller size nozzles are available for lower pressures.

Description: Nozzle can be used at long range with straight stream for cooling or change to fog portion for close-in work to protect personnel, for shutting off valves, rescue work, etc. For use with both Groups 1 and 2 fires, and has the instant alternate use of high or low velocity fog. Dangerous flare-ups caused by straight stream agitation of liquids is prevented through the action of the nozzle, inasmuch as the fog side operates prior to the forceful straight stream.

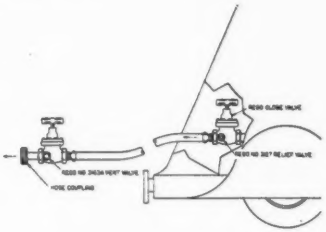


Bleeder Valve

The Bastian-Blessing Co., 4201 W. Peterson Ave., Chicago.

Model: Rego No. 3163A vent (or bleeder) valve.

Application: Designed for use on the shutoff valve at the end of the filling hose.



Description: After container has been filled, the globe valve on the outlet of the filling hose is closed; next, the globe valve on the truck is closed. Before the hose coupling is disconnected from the filler valve on the container, the vent valve is opened to release the liquid trapped in the hose coupling. This is an important safety precaution—to eliminate the possibility of liquid being discharged on the operator when the hose coupling is disconnected. This precaution also enables the operator to determine whether or not the filler valve has closed properly.

Also shown on the illustration is

An Honored Name in the Gas Appliance Industry for FIFTY YEARS

Lawson

Lawson's leadership in gas appliance manufacturing is based on much more than long experience. In design, workmanship and actual field performance, each Lawson product is an individual leader and measures up to the highest standards of quality.

Lawson appliances are specially designed for the type of fuel to be employed. They bring to the bottled gas user the finest water or space heating service that engineering skill and manufacturing experience can produce.

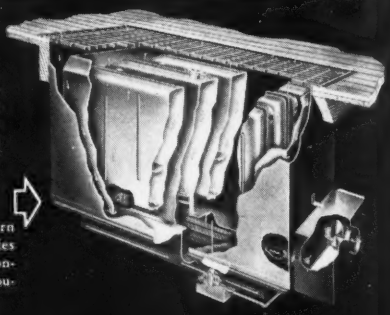
Specially Designed for use with L.P. Gas

AUTOMATIC GAS WATER HEATER

Smart design and finish. Completely automatic with full safety pilot controls. Thick Fiberglas insulation. Built with controls concealed or exposed. Available with 10-year guaranteed Dec-a-dur tank.

GAS FLOOR FURNACE

Efficient circulating air heating system with modern room temperature controls, if desired. Occupies minimum space below floor. Complete safety controls. Available in 3 sizes with 35, 50 or 65 thousand B.T.U. input ratings.

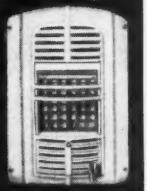


COPPER COIL WATER HEATER

Simple operating double coil heater for use with 30-40 gallon range boiler. Thick Fiberglas insulation. Supplied for manual or automatic operation. Coils easily replaceable.

WALL INSERT HEATER

Compact radiant wall heater provides both circulating and radiant heat for bath or other small rooms. Manually operated. Safety clothes guards. Sparkling white enamel finish.



GAS & ELECTRIC Lawson APPLIANCES

Lawson MANUFACTURING COMPANY

300 NORTH LEXINGTON AVE. • PITTSBURGH 8, PA.

the Rego No. 3127 relief valve—another safety device. After a filling operation, liquid is trapped in the hose between the two globe valves. A slight increase in temperature will cause excessive hydrostatic pressure within the hose. This small relief valve prevents damage to the hose or the diaphragm of the shutoff valve. Designed for use in the shutoff valve at the truck, it protects the full hose from possible high hydrostatic pressures and gives the hose longer life.

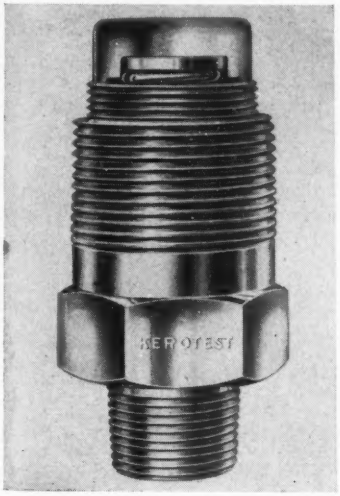
Pressure Relief Valve

Kerotest Manufacturing Co., 2525 Liberty Ave., Pittsburgh, Pa.

Model: Full-Lift Pressure Relief Valve.

Application: Designed to provide a maximum discharge capacity for a given pipe size and pressure setting.

Description: The valve, which is listed with Underwriters' Laboratories, has seating material of a special substance which is not affected by the solvent action of LP-Gas and which is treated so as not to influence the pressure setting of the valve. Valve springs are of plated, heat-treated, spring steel and are designed to retain permanently their initial setting.



Safety Flash Light

Lennan Lights, Inc., 231 W. Olive Ave., Burbank, Calif.

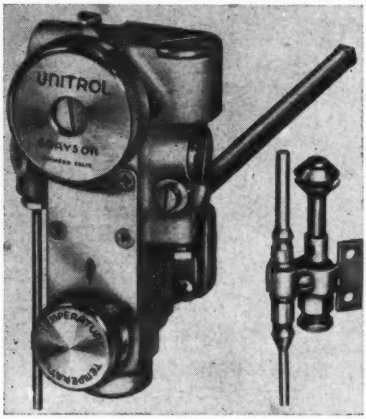
Model: Rub - R - Lite "K" Flashlight.

Application: Approved by Underwriters' Laboratories for Class 1, Group D, hazardous locations.

Description: All working parts are contained in a small sealed-in-head unit which is popped in or out of the steel-lined Neoprene case whenever bulb or batteries are to be changed.

A specially designed 1 - button switch, carrying a 10-year guarantee, has been introduced. Each position automatically locks, insuring against accidentally turning the light on. The prefocused "head unit" and batteries become sealed inside the Neoprene rubber case, which gives longer life

to batteries and permits much abuse. The Neoprene is compounded to resist deterioration from water, oil, gasoline, solvents, non-oxidizing and dilute acids, alkalies and salt solutions, and withstands sunlight, heat, and cold. It is a non-conductor and can be used around high power lines and electrical equipment. There are no exposed metal parts.



Temperature Control

Grayson Heat Control, Ltd., Lynwood, Calif.

Model: Unitrol "A".

Description: The new "Unitrol," Model "A" is a compact safety and temperature control for water heaters of 20 to 75 gals. capacity. It is especially adaptable to modern types of water heaters of concealed or semi-concealed construction. It was designed as a water heater control that would be complete in every respect, yet compact.

The Unitrol "A" can be used with all gases, controls water temperature between 40° F. and 160° F., provides 100% safety shutoff and safe lighting, filters gas ahead of the pilot valve, incorporates the "A", "B", and "C" valves into one unit, provides front accessibility to all adjustments, and facilitates installation and service.

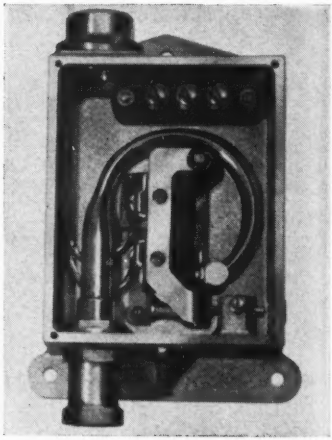
In addition to the features of the old style Unitrol the new Unitrol "A" includes a pilot gas filter of the approved U.G.I. type 100% safety shutoff in any position of the gas cock, increased capacity to 240,000 Btu at a pressure drop of 1.5" water column when using LP-Gas, two-piece construction, and accessibility to all adjustments from the front.

Pressure Operated Switch

Meletron Corp., 950 N. Highland Ave., Los Angeles.

Model: 310.

Application: Widely used as a control mechanism in such fields as chemical processing, petroleum, heating



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"...but you ought to see the Rheem 'Design For Better Business'"

Retailers get all wrapped up in our new plan. They like the Rheem store displays, they see how Rheem cooperative advertising builds up sales, then they try all the other Rheem sales promotion aids. They find it a better way to do business. So why don't you get wrapped up in it too?

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HOME COMFORT APPLIANCES

9 plants in U.S.A.–Foreign affiliated plants in Brisbane, Melbourne, Sydney, Rio de Janeiro, Singapore, and Hamilton, Canada

Water Heaters
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City _____ State _____

and air conditioning, hydraulic systems, etc.

Description: This model is one of a wide line of switches actuated by the pressure of liquid, air, or gas, and embodies such features as convenient adjustment, explosive-proof design for hazardous installations or construction which prohibits tampering, and the Underwriters' Laboratories-approved snap action Micro switch.

A Bourdon tube pressure response element permits adjustments to be made with comparable pressure gauge accuracy and dependability. The low, medium, and high pressure types are each adjustable over a wide range, with a uniform housing dimension provided for all switches regardless of their operating range. No organic materials are exposed to the actuating fluids.

The 310 switch is available in several combinations of switching and adjusting arrangements, depending upon the service required.

High Pressure Strainer

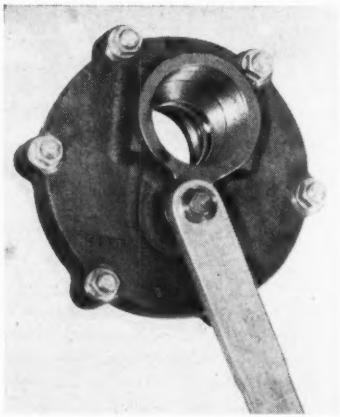
J. A. Zurn Manufacturing Co., Erie, Pa.

Model: "Y" Strainers.

Application: Unit is suitable for close quarter installations, as well as normal installations, as the perforated strainer sleeve fits snugly into the body and is designed for pressures up to 600 lb.

Description: This high pressure Y-type strainer is made with threaded flanged or welded connections in many standard sizes or to specifications. Pressure drop through the strainer is reduced to a minimum, it is reported.

The unit is provided with a bolted blow-off connection for blow-down cleaning, and each strainer is hydrostatically tested according to service conditions under which they are required to operate. The strainer is available in various metals, including cast bronze, brass, cast iron, and cast steel. It is also available with a magnetized strainer plug for intercepting small ferrous particles.



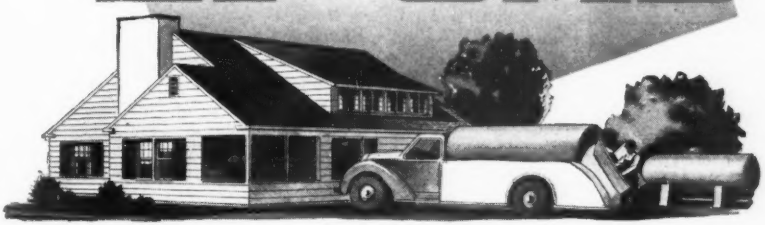
Shutoff Valve

Saval Co., 1915 E. 51st St., Los Angeles.

Application: Designed for butane and other similar services, the unit is also available for water or corrosive

for the **VOLUME MARKET**

Sell AUTOMATIC HEATING WITH L-P GAS



YOU open the way to substantial new volume with stable profits when you sell L-P Gas for automatic heating. The market's here and it's one that's growing rapidly. So get in at the start—get the jump on competition by establishing yourself in this field before others follow.

And for every job you sell, make certain the controls are Honeywell. Only Honeywell makes a *complete* line—thermostats, solenoid, motorized and diaphragm valves and pilotstats—specifically designed and tested at higher pressures for L-P G.

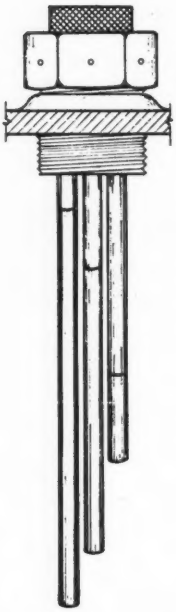
To support your activities, Honeywell's nation-wide sales and service organization is ready to respond whenever you call. So, for automatic controls, always sell Honeywell—the name that's known. Minneapolis-Honeywell, Minneapolis 8, Minnesota. In Canada: Toronto 12, Ontario.

MINNEAPOLIS Honeywell CONTROL SYSTEMS

service with a heavy cast bronze body. Specially for quick opening at bulk plants.

Description: Featuring quick-opening operation, leak-proof characteristics, and heavy-duty, all-steel construction, the valve employs Saval's patented "shear-seal" principle which provides a metal-to-metal seal that is self-aligning and automatically compensates for wear. The unit is not critical to dirt because foreign materials are wiped away instead of lodging between the sealing surfaces.

Liquid Level Tank Gauge

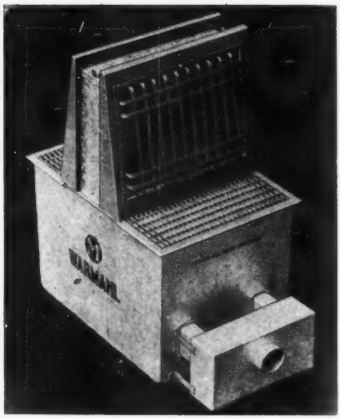


The Gaugemaster Co., 21 Hobbs Terrace, Jefferson City, Mo.

Model: L-P and A.A.

Application: Designed to eliminate costly calls because of failures. "L-P" is made for LP-Gas or liquids not injurious to brass. "A.A." is for anhydrous ammonia or any other liquid requiring all steel construction.

Description: This liquid level gauge is made of high grade metals and comes completely assembled ready to screw into tank. It fits standard ¾ in. pipe threads. The gauge is guaranteed for life of the tank.



Pitless Floor Furnaces

Mahl Manufacturing Co., 3081 E. Slauson Ave., Huntington Park, Calif.

Model: "Veri-Shallow" Warmahl Pitless.

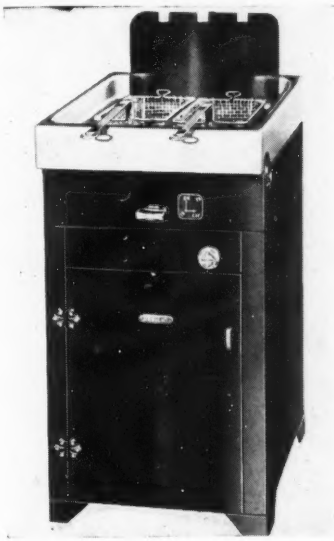
Application: Domestic LP-Gas dual and floor furnaces which do not require basement for installation.

Description: The overall height is 25½ in. The Btu input ranges from 37,500 to 50,000. Various types of controls and safety devices are available: manually controlled equipped with Baso 100% safety valve; automatic non-electric with Baso safety valve; and automatic electric with Minneapolis-Honeywell electric thermostat system and Baso 100% safety valve.

The floor and wall registers are of a durable finish which blends in with flooring as well as hardware and modern fixtures.

The air for combustion is taken from under the house. Heating element is welded gas tight and made of heavy gauge steel. The unit is also equipped with a cast iron economizer

burner; double insulated type inner casing; rust and mineral resisting outer casing; removable floor registers; down draft diverter; and pressure regulator, AGA certified for equalizing pressures to a constant even flow.



Deep Fat Fryers

Detroit-Michigan Stove Co., 6900 E. Jefferson Ave., Detroit, Mich.

Model: Garland No. 14-00.

Application: Commercial installations for serving individual orders faster and a greater number of orders during rush hours.

Description: A new feature is the use of stainless steel baffles inside each of four oval-shaped tubes which permit application of a greater amount of heat to the tubes in the fryer bowl. But, because the baffles spread heat more evenly over the tube area, the fat is not subjected to extreme "spot" heat.

It has been found by the manufacturer that the quality of deep fried food is improved because faster frying and quicker heat recovery reduces absorption of fat by the food and the new lower cold zone temperature also contributes to food quality by further preventing charred food particles from rising and clinging to food.

Models are available for use as a separate unit or in battery and can be used with LP-Gas, natural or manufactured.

Floor Furnace

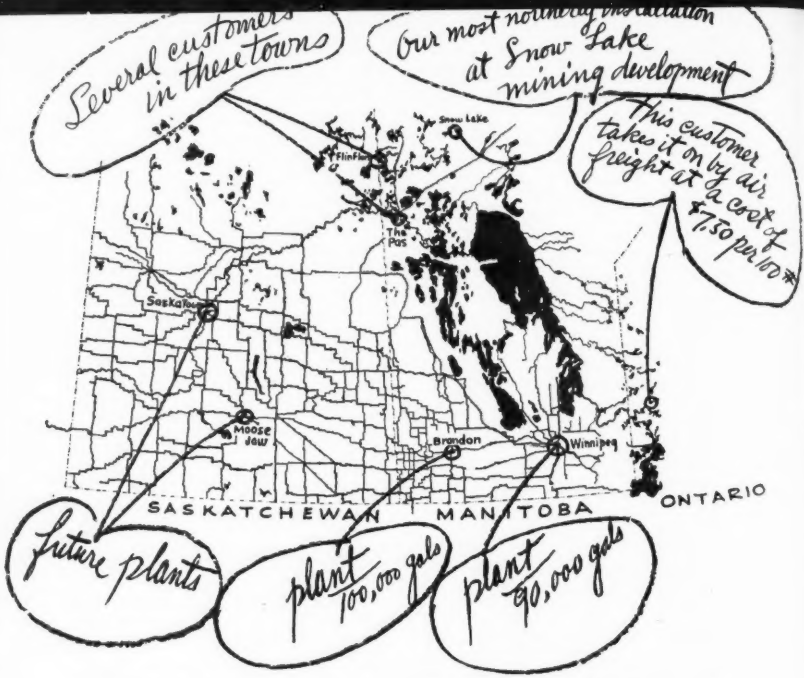
Fraser & Johnston Co., 725 Potrero Ave., San Francisco.

Model: "Lo-Boy" No. 25, 30, and 35 FF.

Application: Designed especially for homes, schools, stores, churches and other buildings without basement facilities.

Description: This new shallow model heater is only 26½ in. deep overall and 14 in. wide, permitting installation without cutting floor joists. It is available in both dual-wall and floor models. The dual-wall design features the new Fraser & Johnston "Bi-Flo" register head which eliminates the need of floor grilles. The register is installed in the wall between two areas so that either one or both can be heated.

The new models also feature a single rod control valve which is made possible by interlocking action of pilot and main burner; heavy duty cast iron high primary air slotted burners; downdraft diverter; streamlined heating element constructed of pressed steel, which is welded into one piece so that gas fumes cannot escape into a room.



Examination of this map will show something of the scope of the operations of Home Gas from its main office in Winnipeg.

Winnipeg Company Flies Propane To Isolated Consumers

SOME Canadians consider their LP-Gas so important to household comfort that they are having it flown in to them by airplane. It is the only way a number of consumers in the far-flung north country can get prompt delivery on the fuel.

Home Gas Ltd., Winnipeg, Manitoba, will drop a 100-lb. cylinder of propane on a remotely isolated community for $7.50 in air freight charges. Apparently the Canadian customers think the convenience of using gas in their homes is worth the extra costs.

Most of the customers served by Home Gas of Winnipeg are spread

Only the Leader

Gives the User Such Flexibility of Cooking Top Heat

GARLAND
No. 45-28CX

Only Garland Has *Front-Firing!*

Easier to sell because it leads in value! **More profitable** to sell because it leads in sales! That's why dealers all over the country say "Garland is my No. 1 line." If you would like to line up with the line of the leader, where Garland is not now represented, write us. We have an attractive program of dealer cooperation and extensive advertising. All Garland equipment is available for use with manufactured, natural, and L-P gas.

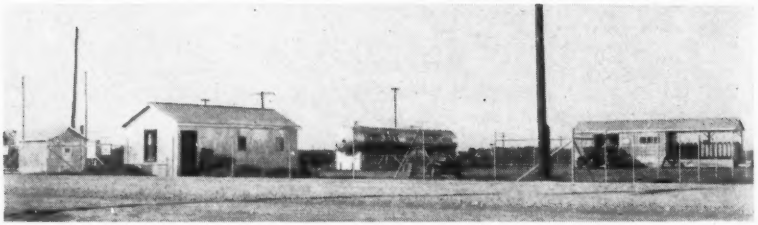
GARLAND*

THE TREND IS TO GAS FOR ALL COMMERCIAL COOKING

Heavy Duty Ranges • Restaurant Ranges • Broilers • Deep Fat Fryers • Toasters
Roasting Ovens • Griddles • Counter Griddles

PRODUCTS OF DETROIT-MICHIGAN STOVE CO., DETROIT 31, MICHIGAN

*REG. U. S. PAT. OFF.



The Brandon, Man., bulk plant of Home Gas Ltd., Winnipeg.

out over a wide area. The operation covers northern Ontario, all of Manitoba, and southern Saskatchewan. The business has reached a volume, however, which rivals that of many operators in the United States. The company maintains bulk stations in Winnipeg and Brandon with a total storage capacity of 120,000 gal. The organization started delivering propane to customers only last May.

H. ALTY

Managing director of the new enterprise is H. Alty, of Winnipeg. He is assisted by Operations Manager Jones. The company also has a wholesale department which keeps three salesmen on the road. Home Gas is an exclusive distributor for such firms as Weatherhead Co., Rheem Manufacturing Co., A. R. Wood brooders, and several American range and heater manufacturers.

Building 30 Bulk Plants

Propane is something new to the Canadian public. It has taken hold with startling rapidity, however, and there are no less than 30 bulk stations in the course of construction throughout the provinces.

Home Gas storage installations were engineered by the United Petroleum Gas Co., Minneapolis. Both of the company's plants are of sim-

C. V. JONES

ilar construction. The Winnipeg plant has 90,000 gals. of the storage and Brandon 30,000 gals.

Most of Canada, of course, is an extremely cold weather zone. Winters are long and temperatures drop as low as —46° F. In spite of severe weather conditions and a wide area of operations, Home Gas hasn't had much trouble keeping up with service on domestic systems. The use of automatic manifolds on cylinder installations, nevertheless, is considered a necessity. They enable customers to draw vapor from both containers when especially cold conditions prevail throughout the northlands.

On the map that accompanies this material Mr. Alty has indicated the scope of his company's LP-Gas activities. It hasn't been necessary to actually parachute cylinders to isolated users from aircraft. But the fact that Canadians are willing to pay air freight on propane shows promise of phenomenal development north of the U. S. border, up Canada way.

Lon Turner Studies Industry On Long Tour Eastern U. S.

Lon D. Turner, head of the butane-propane and gas-air equipment departments of the Eaton Metal Products Co., Denver, has recently completed an 8000-mile inspection tour covering the eastern portion of the United States. He visited 31 different installations of Eaton gas-air equipment in order to learn at first hand the problems of the operators and to determine what improvements might be made in Eaton equipment.

Mr. Turner expressed the opinion that the application of LP-Gas in industry was only beginning and that there was great opportunity for expansion in that field, as well as for domestic uses.

Illinois Butane Company Receives LP-Gas Charter

Illinois Butane Gas and Equipment Co. has been granted a state charter of incorporation, according to a report from the Illinois secretary of state's office.

H. T. Clarne, Alvin J. Woelfle and L. L. Williams are incorporators.

Service at a Loss May Become Profit in Long Run to Dealer

By HARRY L. SPOONER

ALTHOUGH W. T. Shols had never operated a retail bottled gas and appliance business when he went to Peoria, Ill., and became an authorized Skelgas dealer in March, 1946, he was well aware of all the problems connected with the business because he had been district salesman at Joliet, Ill., selling Skelgas and appliances to dealers.

Through his contacts with these dealers, he became intimately acquainted with the retail business. He found that many dealer problems stemmed from incorrect installations and imperfect service. Therefore, when he planned on becoming a dealer, himself, he determined to take every possible pain with installation and service work right at the outset and so eliminate future troubles. In other words, no matter how long it took, he would practice a policy of "an ounce of prevention is worth a pound of cure."

Needs Equipment and Appliances

This policy has worked wonders, so that installation and service problems are now almost nothing. His big problem, and it is a big one, is to get enough cylinders and appliances to take care of the business.

One cardinal principle with Mr. Shols, in order to prevent troubles at the outset, is to thoroughly check every appliance before it is taken to the customer's premises. "We don't like," he says, "to take an appliance from the crate, put it on the truck, deliver it, and then have to revamp it in the presence of the customer. If this is done, he or she will begin to wonder what they have paid $200, or some other sum, for. Therefore, we check and adjust everything before it leaves our store.

"When the customer sees the appliance start up without any fuss or trouble, he is sold on his purchase. We not only adjust the regulator and the burners but we also see that every range drawer and door works perfectly before we take the appliance out.

"Because of our practice of adjusting everything before it goes out, we are able to give our own guarantee of a year's free service. This guarantee is in addition to the manufacturer's guarantee against poor workmanship and defective material."

When Mr. Shols took over the dealership, he found many appliances already in use that were in bad condition. So, while not required to, he has been making minor adjustments on these free of charge and for major ones just enough to cover the cost. In many cases, considerable time is used in making adjustments that cannot be covered by a charge. For instance, replacement of a minor part which might not cost over 60c has been known to require as much as 1½ to 2 hours to make the trip and install the part. "We don't make any profit in our repair department," says Mr. Shols. "We make many adjustments and repairs at a loss and still we consider it good business from the angle of future relations with our customers and our reputation for service."

In addition to finding many repairs

and adjustments necessary when first starting in, some customers were found who were not getting as much service as they should from a cylinder of gas. So Mr. Shols started checking over such installations to find the trouble. He wanted every customer to have as economical operation as possible. In some cases small leaks were found which were corrected and helped save gas. Again, the regulators were not set at the proper pressure. In still other cases, regulators were not holding the pressure properly and were replaced with new ones.

"Although regulators are sturdy pieces of equipment," says Mr. Shols, "they still should be checked from time to time. They should be checked whenever gas consumption is more than usual. They should be checked at least every five years even though they may not have given any trouble. If, for any reason, it is necessary for us to do any work on a customer's premises that involves moving a regulator, we give it a complete check at this time. This has cut down future service calls. These jobs also give an opportunity to see that old installations have been properly made. Many farmers move from place to place and take their equipment with them. When they do this, we always make a careful check of the equipment before it is re-installed."

Many service calls come from a lack of understanding by the customer that air adjustments for the burners must be kept properly adjusted or the mixture of air and gas for which they are set will not be correct and there will then be trouble in the operation of the range. Mr. Shols or his service man shows them how they themselves, can determine this if this is the reason the range is not working properly. He tells them how im-

Mr. and Mrs. W. T. Shols look over their attractive appliance display in Peoria, Ill.

portant it is that the air shutters not be allowed to clog up but should be kept clean at all times to assure a gas-air mixture which results in perfect burner operation.

The same kind of prompt service is given on gas as on appliances. If a customer unexpectedly runs out of gas, Mr. Shols sends a service man just as soon as possible. This "just as soon as possible" does not mean that the customer has to wait until the truck is going out that way, but at once. These cases do not happen very often as gas service is properly scheduled at all times. But when they do, there are no delays.

Never Lets Customer Down

A round trip of 40 miles has been made to service one household customer. In such cases, there is no profit in the trip. But Mr. Shols considers the good will built up is worth the loss of profit. Quite a number of eating places in the country and small towns use bottled gas for cooking and when any of these run out of gas, the same split-second service is given as that to householders.

In the territory serviced by Mr. Shols, which extends for about a 30-mile radius, there are quite a number of rural electrification lines. These, however, are not serious competition except on water heaters. Most rural users of electricity have to pay a minimum bill, which is usually more than the current covered by lighting and small appliances, and so install water heaters to get the worth of their money.

Most electric users prefer bottled gas for cooking for several reasons, says Mr. Shols. Bottled gas is more economical both in operation and in installation costs where re-wiring is necessary for electric ranges. The speed of gas over electricity is in its favor. Uninterrupted service is another advantage of gas as, in the country, tree limbs often fall across electric wires and disrupt the service. In addition to rural business, Mr. Shols has several city customers whose homes already have city gas but who, from their experience in the country, prefer bottled gas.

In addition to household users, many taverns, restaurants and other eating places in the country and small towns use bottled gas. One meat packer in the area uses bottled gas to singe hogs. A small factory uses it for heating a degreasing tank using oakite solution. Another customer uses it for heating asphalt for impregnating cork sheets in insulation work.

Mr. Shols maintains an attractive store. It is located at 220 Franklin St. in the Skelly building. Five streets intersect at the corner where the building is located. The building, therefore, occupies a triangular space and the Shols store is triangular in shape. The long side of the triangle is the street side, thus giving a frontage of 40 feet, which is entirely devoted to display windows. The windows have low ledges, suitable for the display of any kind of appliances.

At present the staff consists of Mr. Shols, Mrs. Shols, and their son-in-law, Ray Marquardt. Mrs. Shols keeps the books and records and acts as floor saleslady. Mr. Marquardt is service and installation man. Mr. Shols is manager, field salesman, and helps in service work.

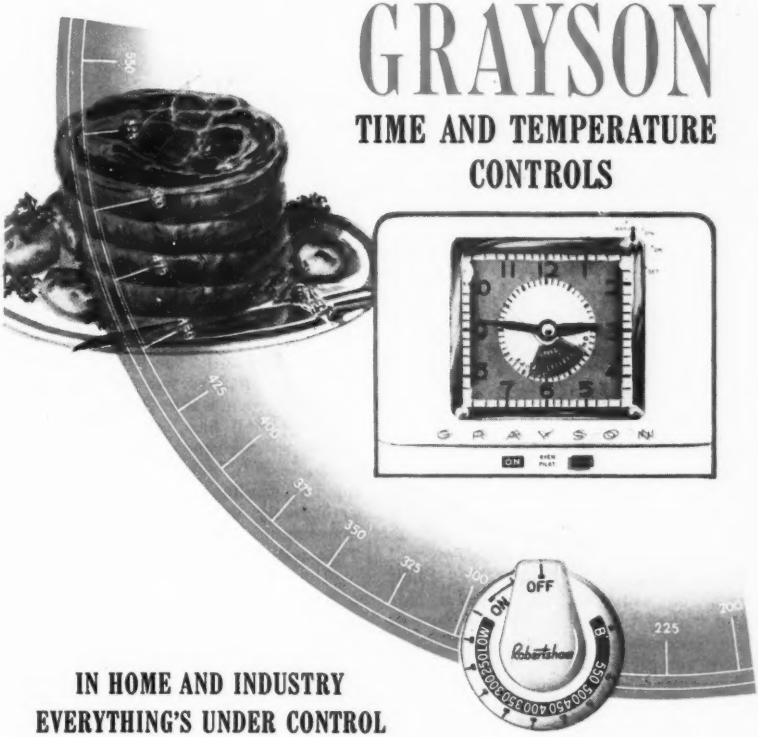
The great shortage of cylinders has held up sales work to a large extent. While some models of appliances are still scarce and coming through slowly, an attempt is made to have a specimen of each model of ranges, refrigerators, water heaters and space heaters on the floor. In addition to these, electric deep freeze cabinets are handled.

Handicapped by the shortage of cylinders and appliances, but little ad-

ROBERTSHAW

GRAYSON

TIME AND TEMPERATURE CONTROLS



IN HOME AND INDUSTRY
EVERYTHING'S UNDER CONTROL

Robertshaw-Fulton

CONTROLS COMPANY

YOUNGWOOD, PENNSYLVANIA

GRAYSON CONTROLS DIVISION, Lynwood, California
FULTON SYLPHON DIVISION, Knoxville, Tennessee
AMERICAN THERMOMETER DIVISION, St. Louis, Missouri
BRIDGEPORT THERMOSTAT DIVISION, Bridgeport, Connecticut

Standing beside a Shols delivery truck in front of the Peoria, Ill., store are (left to right) Mr. Shols and Ray Marquardt, service man.

vertising is being done at present. This consists for the most part of small display ads in small-town papers in territory where Mr. Shols is desirous of working intensively. These ads list bottled gas and the different kinds of appliances handled.

When cylinders and appliances become available in fair quantity, a rather extensive promotional program will be used. Personal solicitation will be a principal method. Mr. Shols plans on using all his time for this and will employ as many salesmen as are necessary. Mr. Marquardt will have complete charge of the service department, with as many helpers as necessary. Mrs. Shols will have additional floor salespeople.

Mr. Shols is partial to cooking schools as a promotional method and will have these in small towns, preferably on Saturdays, when he can secure the use of school auditoriums. He will put out handbills and employ a cooking expert to demonstrate bottled gas cooking.

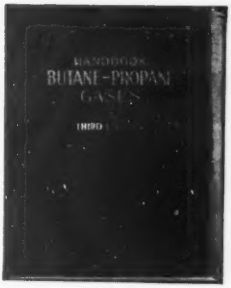
An effort will be made to tie up with business houses in these small towns to handle the appliances. Residents will then be able to deal with local merchants for the appliances and these dealers will get the profit on this part of the business.

Direct mail has been used to some extent to sell one or more additional appliances to customers already using gas appliances. Direct mail will be extensively used when cylinders and merchandise are readily available. This will include personal letters as well as manufacturers' literature as Mr. Shols believes in using the personal touch in direct mail as well as in direct personal contacts.

Personal contacts will be made by both special salesmen and by service men. The latter will be paid a salary and commission so they will take an interest in selling. "One of the hardest things in the selling game," says Mr. Shols, "is securing an audience with prospects. The service man already has the ice broken when he goes in to collect for gas. He has the further advantage of knowing what appliances the customer already has, so he can concentrate his efforts on those they do not have.

"In this connection, our salesmen

HANDBOOK BUTANE-PROPANE GASES



REVISED JUNE, 1947

- **Up-to-date technical facts on LP-Gases.**
- **352 Pages. Illustrated with Charts. Diagrams and Photographs.**

Check this partial list of contents.

INTRODUCTION
- The Progress of the Industry and the History of its Development.
- The ABC of LP-Gas, an Introduction to LP-Gas Operations.

PHYSICAL AND CHEMICAL PROPERTIES
- Properties of the Hydrocarbons in LP-Gas.
- Properties of Butane-Propane Mixtures
- Volume Correction Factors
- Analytical Determination and Testing

PRODUCTION OF LP-GAS
- Natural Gasoline Plants, Recycling Plants, Oil Refineries

TRANSPORTATION AND STORAGE
- Delivery by Truck, Rail, Water, and Pipe Lines
- Storage Tank & Pressure Vessel Design
- Liquid Metering and Pumping Systems

UTILIZATION OF LP-GAS
- Comparative Performance with other Fuels
- Appliance Installation and Testing
- Domestic Applications
- Commercial Applications
- Industrial Applications
- Enrichment, Peak Load and Standby Uses
- A Fuel for Internal Combustion Engines

DISTRIBUTION OF LP-GAS
- Installing and Servicing LP-Gas Systems
- Semi-Bulk Systems
- Bottled Gas Systems
- Gas Utility Service from Central Plants
- Multiple Utility Service from a Central Plant

REGULATIONS
- N.B.F.U. Pamphlet No. 58 (1947).
- Motor Carrier Regulations
- Freight Regulations
- Unloading Tank Cars
- Marine Regulations

APPENDIX
- Products Liability Insurance
- Handy Tables for Field Use
- The Interchangeability of Other Fuel Gases with Natural Gases
- Flame Weeding
- Bibliography
- Glossary of Terms

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Published by

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and service men will make friends of all customers. They will never be too busy to stop and listen to customers about anything in which they are interested — to sympathize with them in their troubles and problems and to give them advice when asked to do so about anything about which they know. In other words, they will become trusted friends of customers.

"Service men will be trained to take advantage of all new building projects in their territory. A wide-awake deliveryman, as soon as he sees a foundation of a home being started, will contact the owner if the home is outside city gas territory."

Will Give Radio a Trial

It is also planned to use radio announcements when the situation becomes normal again. Short moving pictures will be used in small-town theaters featuring the use of bottled gas in home making.

Billboards will be used in proximity to small towns, especially those in which local dealers will handle the appliances.

Floor displays and window displays will continue to form an important part of the promotional program. With the wide expanse of window space, the entire floor of the store is in reality both floor and window display.

Can Now Build LP-Gas Ranges To "CP" Specifications

"CP" specifications for ranges using LP-Gases and butane-air gases, adopted by the Gas Appliance Manufacturers Assn. on recommendations by the Liquefied Petroleum Gas Assn., will result in supplying the LP-Gas user with automatic gas ranges built to the high "CP" (certified performance) standards which have proved so effective in increasing consumer acceptance and in building sales of better-grade gas ranges in the natural and manufactured gas industries.

The introduction of the "CP" program into the LP-Gas field will not only provide an unbiased quality buying guide to the LP-Gas users, but will enable LP-Gas range dealers to capitalize immediately on the national acceptance for "CP" built up over 10 years of continued intensive gas industry promotion, and the $4,000,000 gas industry expenditure being put behind automatic gas cooking in 1948.

Introduced in 1938 to provide the consumer with a buying guide to top-quality gas cooking appliances, the "CP" program has been in a large way responsible for changing the buying and selling of gas ranges from price to cooking performance. This has resulted in better appliances for the consumer, lower sales resistance and lower service costs for the dealer.

Unique in the merchandising field, the "CP" seal on a gas range indicates that the appliance has been manufactured by a member of the Gas Appliance Manufacturers Assn. to the highest uniform standards of the association. Before the gas range can bear the "CP" seal, it must be tested by an unbiased laboratory other than the manufacturer's, to make sure it meets the "CP" specifications. As an additional consumer advantage, "spot" checks are made on manufacturers' assembly lines at unscheduled intervals.

The new "CP" requirements for LP-Gases and butane-air gases are, in a large degree, the same as those for manufactured and natural gases, with the exception that "100% automatic shutoff" is required on the oven burner, and burner capacities and efficiencies specified are similar to existing American Standards Approval Requirements for LP-Gases or butane-air gases.

THE TRADE

E. S. CARLEY

J. G. VLAHOS

E. S. Carley has been placed in charge of order and distribution of butane and propane for the **Anchor Petroleum Co.**, Tulsa.

Mr. Carley, who has been with Anchor Petroleum for two years, was elevated to his present position following the transfer of O. L. Ely to the newly-opened offices of the company in Los Angeles. Formerly he was with the Wilcox Oil Co.

W. A. Baden, president of Anchor, in making the announcement of Mr. Carley's appointment, also stated that J. G. Vlahos has been made assistant to Mr. Ely, who is manager of West Coast operations for the company. Mr. Vlahos has been with the firm for about two years.

Thomas Truck and Caster Co., Keokuk, Iowa, and Buffalo, N. Y., has announced the appointment of W. L. Hutton as vice president and general

▲

This is the first bargeload of LP-Gas tanks shipped by Delta Tank Manufacturing Co., Inc., Baton Rouge, La. The tanks are moving up the Mississippi river to St. Louis and St. Paul via American Barge Lines. The tanks were manufactured by Delta with Anco Manufacturing & Supply Co. as purchasers.

▽

Determine COMBUSTIBILITY
at a glance with
J-W
Combustible
GAS INDICATOR
Concentration of gas or vapor is shown immediately and accurately by the J-W indicator meter in terms of explosibility.

Distributors

Engineering Supply Co.
2656 Main St.,
Dallas 1, Texas

Safety First Supply Co.
530 Fernando St.,
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Universal Safety Equipment Co.
2921 No. Cicero Ave.,
Chicago 41, Ill.

Averill Equipment Co.
6527 Hamilton Ave.,
Detroit 2, Mich.

American Allsafe Co., Inc.
1245 Niagara St.,
Buffalo 13, N. Y.

Guardian Safety Equipment Co.
491 Prospect St.,
East Orange, N. J.

C. D. Genter Co.
2109 Broad St.,
Chattanooga, Tenn.

W. P. & R. S. Mars Co.
324 W. Michigan St.,
Duluth, Minn.

E. D. BULLARD COMPANY
275 EIGHTH ST., SAN FRANCISCO 3, CALIF.
6719 S. FIGUEROA, LOS ANGELES 3, CALIF.

EVERYTHING BULLARD IN SAFETY

sales manager. This is one of the first steps in an extensive expansion program planned by the Keokuk company.

For the past three years Mr. Hutton has been president of the Hutton Wheel Corp. of St. Louis, recently purchased by the Thomas company, and combined with the Buffalo subsidiary, Buffalo Caster and Wheel Corp. Before going to St. Louis he was sales manager of Thomas Truck and Caster Co.

Mr. Hutton will headquarter and live in Keokuk where the executive offices of the Thomas company are located.

REX V. PHELPS

Appointment of Rex V. Phelps to a recently created position of manager of **Warren Maritime Corp.** has been announced by G. L. Brennan, vice president. He will continue to serve as chief sales engineer for the liquefied petroleum gas division of Warren Petroleum Corp., of which the maritime corporation is a wholly owned subsidiary.

Mr. Phelps' promotion follows his supervision of engineering and other details of the successful development of the S. S. "Natalie O. Warren," first tank ship ever designed for the sole purpose of transporting propane as well as other liquefied petroleum gases. This vessel is now owned and operated by Warren Maritime Corp.

Thomas H. Pender recently was named advertising manager and director of public relations for the Robertshaw-Fulton Controls Co., **Grayson Controls Division,** Lynwood, Calif. An-

Now — Southern Gas & Equipment Co. Offers

America's SAFEST Truck Tank

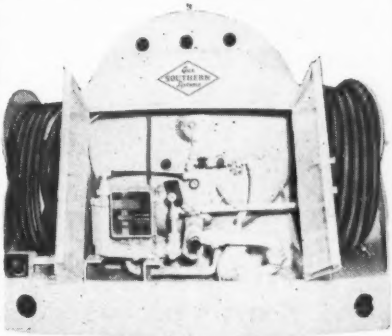
ENGINEERED FOR SAFETY

DESIGNED FOR PERFORMANCE

FABRICATED FOR SERVICE

It features: Relief valves recessed into shell (they will not break off or become damaged if truck turns over) • SAFETY cabinet containing pump—meter—valves—gauges attractively and securely fastened to rear of tank • Smooth, automatically welded seams • Built under ASME code par. U-69 specifications • ICC regulation lighting • Convenient hose racks • Fire extinguisher mounted for accessibility • Choice of several body designs • Pump piping arranged to transfer liquid independent of truck tank • Hi-tensile, light weight steel • Furnished complete on 1948 model truck—ready to drive off.

Rear View of Southern Gas & Equipment Co. New SAFETY Truck Tank



All fittings (except recessed relief valves) are in rear head and all piping contained in specially designed cabinet for 100% SAFETY • With this new construction, road shock does not affect piping and eliminates leaky connections • Hose wraps on convenient spool • Pump and meter sheltered from the dirt and grime of the road • All parts and fittings easily reached for lubrication and repair • Extra heavy rear bumper protects cabinet from the rear.

Illustrated is a standard 1250 water gallon 200 PSI SAFETY tank mounted on KBS-5 International which can be furnished making a complete job ready for use.

Your inquiries are invited on Twin Tank Delivery Trucks—Transport Trucks Storage Vessels—Skid Tanks—Fuel Tanks, etc.

SOUTHERN GAS & EQUIPMENT CO.

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Gas SOUTHERN Systems

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TEXAS DIVISION: HOUSTON 6

Liquefied Petroleum Gas

Cities Service Oil Co.

•

A DEPENDABLE SOURCE
UNIFORM PRODUCTS
A CAPABLE SUPPLIER
TWENTY YEARS' EXPERIENCE

•

IN LP GAS ALSO

CITIES SERVICE
MEANS
GOOD SERVICE

•

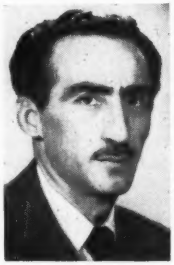
CITIES SERVICE OIL CO. (Del.)

•

BARTLESVILLE, OKLA.
CHICAGO, ILL.
Other Sales Offices
Cleveland Kansas City
St. Paul Toronto

nouncement was made by T. T. Arden, executive vice president.

Mr. Pender has had wide experience in the gas controls field, becoming associated with Grayson Controls in 1933. Since that time he has filled many positions within the organization including personnel manager and most recently director of industrial relations.



ELI SHAPIRO

RAY THACKER

The Dearborn Stove Co., Dallas, recently announced the appointment of Ray Thacker to the newly created position of advertising and sales promotion manager. Dearborn president, Roy M. Liedstrand, in reporting the addition to his executive staff, stated that Mr. Thacker has had wide experience in hard goods sales in the Southwestern and Pacific Coast states, much of it in the aviation industry.

Eli Shapiro, chief engineer for Dearborn, was honored recently by election to an important post in the American Gas Assn.

At the annual meeting of the Direct Heating Equipment Division of the Gas Appliance Manufacturers Assn., held at the Drake Hotel, Chicago, Mr. Shapiro was elected one of the six representatives of the nation's gas heater manufacturers on the American Gas Assn. sub-committee on ap-

CAPACITY
PROPANE 105
BUTANE 95

. . . for increasing Volume

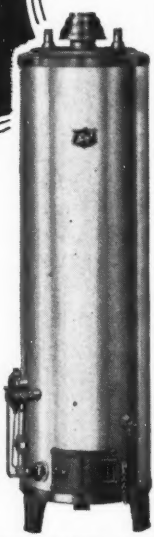
A larger, lightweight meter, the Sprague Zephyr was designed especially for LP-Gas installations. Incorporated are all the proven Sprague features of simplified assembly, interchangeable parts and strong aluminum and cast iron cases, that assure long life and low maintenance costs.

SPRAGUE

GAS MEASURING AND REGULATING EQUIPMENT

THE SPRAGUE METER COMPANY
BRIDGEPORT 4, CONN.

Hoyt
LP-GAS
WATER HEATERS



A complete L-P line for dealer profit

There are Hoyt LP-gas automatic storage water heaters in every price range to give you the size and type your customer wants. Among them the Copper Heart – Hoyt Steel – Hoyt Heatane.

Outstanding Hoyt features – specially designed jet-type LP-gas burners – full floating tanks – safety snap-action thermostat and pilot control – fibre glass insulation – build sales and customer confidence. Mail coupon for details.

A Great Name in Water Heaters Since 1910

Hoyt Heater Co.

Los Angeles 11, California

Hoyt Heater Co., 2146 E. 25th St., Los Angeles 11, Calif.
Please give me complete information on Hoyt LP-gas water heaters.

SIGNED_____

FIRM NAME_____

ADDRESS_____

CITY AND STATE_____

proval requirements for gas space heaters. Other committee members include representatives from the U. S. Bureau of Mines, gas utility companies and the AGA.

The sub-committee on approval requirements reviews all requests for additions to or changes in requirements for gas space heating equipment. The committee also arbitrates disagreements between manufacturers and the AGA involving gas heater requirements.

W. D. CROUCH

W. D. Crouch, general manager of the commercial and industrial division of the **Robertshaw-Fulton Controls Co.**, Youngwood, Pa., has announced his intento retire on July 31 after 30 years of service.

"Walt," as he is known among his many friends in the industry, became associated with Robertshaw in 1918 when the company was known as the Robertshaw Thermostat Co. He is one of the pioneers in the thermostat field.

After retiring, Mr. Crouch will live in Kendallville, Ind., where he has a new home under construction.

Responsibilities as general manager of the commercial and industrial division will be assumed by E. J. Horton, assistant to president at Youngwood, Pa., after Mr. Crouch's retirement.

"Handy Data on Brass Fittings" is the title of a new folder recently published by **The Imperial Brass Manufacturing Co.**, Chicago, which describes the various types of fittings and gives handy size and price list-

Join the team!

Let's not pretend we're rookies — that we don't know the score! All of us carry a bat that can knock the stuffings out of inflation—so LET'S GET TO IT! The only way to beat inflation is to make it a TEAMWORK JOB. If we team up—if we hold our price lines firm—we'll find our suppliers ready to play ball, too. Everybody knows that inflation can only go so far—and then we're in for some bad innings.

The retailer is 'way out in the field. He's got to take what comes. If he gets good, walloping value, he's set. His customers will ask for more. But if the prices are over his customers' heads, they won't even pay the price of admission.

Welbilt has done its part. Welbilt's been in there pitching good, straight value to every retailer, and—judging from the response—has done a good job of it. Let's stop further inflation—let's insure our business—by holding our price lines and urging our suppliers to join the team too.

WELBILT STOVE CO., INC.
Maspeth, L. I., N. Y.

Rx

STIMULANT

for summer sales
Welbilt's budget
model M-178—
just what the
doctor ordered
to remedy that
summer slump.

MORE Welbilt Ranges ARE BEING DELIVERED NOW!

Use PITCO
"KEEP 'EM FRYING"
Frialators
REG. U.S. PAT. OFFICE

SAVE FAT . . . GAS SPACE

Deep-Fat Frying at Its Best

★ Customers can serve a wider variety of fried foods.

★ Left-overs or by-products quickly converted into daily specials.

★ Increase in customer business means increase in the gas load.

★ Actual saving in fat alone more than pays total cost of gas required to operate them.

J. C. PITMAN & SONS SALES CORP.
711-719 Broad St.
West Lynn, Mass.

ings. It also shows a broad range of two- and three-way shutoff valves and drain cocks.

One of the features of the folder is a "How to Recognize" section which gives cross-section views of fitting joints as well as views of the same joints disassembled. The distinguishing features of the different types of fittings are pointed out. Compression, flared, inverted flared, "Flex," "Hi-Duty," threaded sleeve and brass pipe fittings are included.

Copies of this folder may be obtained by writing to the manufacturer and asking for Bulletin No. 352.

G. L. BRISTER

The Hays Manufacturing Co., Erie, Pa., recently appointed Gene L. Brister as sales representative for the South-Central territory, which includes Maryland, District of Columbia, Virginia, North Carolina and South Carolina.

Mr. Brister has had considerable sales and technical experience. During the war, he served as a crew chief and aircraft technician in the United States Navy, and before joining the Hays Manufacturing Co. he was with the sales department of the Electric Auto-Lite Co.

General Controls, manufacturers of automatic temperature, pressure and flow controls, announces the opening of a new and enlarged Denver factory branch office. The new office is located at 1162 Elati St. M. S. Wilson is branch manager of this office.

The Denver office serves General Controls' customers in Colorado, Utah,

Wyoming, Montana, and parts of Idaho, New Mexico, Kansas, Nebraska and South Dakota.

J. F. Day, director of sales for General Controls, has announced the promotion of Mel W. Lewis to branch manager of the Cleveland factory branch office. Mr. Lewis has been associated with General Controls Co. in San Francisco for the past 10 years.

The Cleveland office serves General Controls' customers in most of Ohio, western New York State, northwest Pennsylvania, southeast Indiana, and central Kentucky.

Announcement has been received from the **Liquefied Gas Equipment Corp.** of its removal to new quarters at 2014 Wyandotte St., Kansas City, Mo.

The new location includes offices, warehouse, and display room.

Caloric Stove Corp., with headquarters in Philadelphia, will take inventory at its 130-acre plant at Topton, Pa., beginning June 28, reopening for production on July 12. During this two-week period, most of the plant employes will take their vacations, and plant repairs will be made.

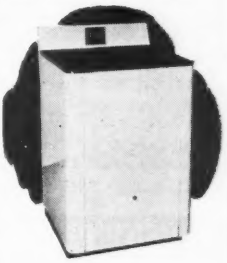
The executive offices in the Widener Building, Philadelphia, will remain open.

Establishment of a factory branch in Pittsburgh is anounced by W. F. Linville, general sales manager for **Bendix Home Appliances, Inc.**, of South Bend, Ind.

W. A. Becker, Midwest regional manager is serving temporarily as manager of the Pittsburgh branch, and Albert A. Smith, a field service supervisor, is temporary service manager.

The Water Heater with SA* Again Available!

Now sufficient materials are available to permit resumption of production on the Handley Brown table top heater that was so widely accepted and proven before the war.



OUTSTANDING FEATURES

- ▼ Patented design makes possible . . .
- ▼ 30 Gallon storage which makes possible
- ▼ Low input heater which makes possible
- ● Elimination of vent (should local rulings require a vent, provisions are built in the heaters for same).
- ● Designed to fit flush-to-wall, vented or unvented.
- ● Table top height.
- ● Easily accessible for service without disconnecting heater.
- ● Fibreglas insulated.
- ● Scientific construction reduces lime formation.
- ● Equipped with 100% safety shut-off controls.
- ● Kitchen or utility room installation provides instantaneous hot water close to outlets eliminating line heat loss.
- ● Reversible linoleum top. Can be matched to kitchen colors.

Proven and Accepted by LP Industry and A.G.A. Laboratory

Handley-Brown HEATER CO.

JACKSON, MICHIGAN

*Sales Appeal and Sex Appeal

At Ease!

Enjoy the SECURITY of COMPLETE INSURANCE PROTECTION

PUBLIC LIABILITY
MOTOR VEHICLE
Insurance Coverage

Insurance covering all hazards for which the operator, distributor or dealer may be liable or assume under contract. Have your insurance agent write for free application blank, covering all questions to be answered in connection with the coverage you desire, or request it direct. No obligation.

Be sure to read the insurance article in this issue.

LIQUEFIED PETROLEUM GAS INSURANCE UNDERWRITERS AGENCY

Louis H. Collar, MANAGER

OFFICE: 402 Insurance Exchange Bldg.; Kansas City 6, Mo. Phone Victor 3563
HOME: 1913 Tauromee Ave., Kansas City 2, Kan.; Ph. DRexel 3331

Lester M. Curtiss, who has been general manager, steel plants, of **Lukens Steel Co.** has been named general works manager of the company and its divisions, By-Products Steel Co. and Lukenweld, according to an announcement by G. D. Spackman, vice president in charge of operations.

Joseph W. Mahanay has joined the Rego department of **The Bastian-Blessing Co.**, Chicago, as sales engineer, announces Ellsworth L. Mills, vice president of the company.

JOS. W. MAHANAY

Mr. Mahanay studied engineering at Kansas State Teachers College and the Spartan School of Aeronautics, and is a graduate of the National LP-Gas Institute at Tulsa, Okla. He had field experience in the installation and servicing of Rego equipment while in the employ of Modern Appliance Co., Denver, a subsidiary of Consolidated Gas and Equipment Co., Plainview, Texas.

Mr. Mahanay plans on making his home in Denver and will work with H. A. Goodwin, district sales manager, in the states of Colorado, Nebraska, North Dakota, and South Dakota.

The **Lawson Manufacturing Co.**, Pittsburgh, makers of water and space heating appliances, announces the appointment of Jack P. Hutchinson as general sales manager.

Mr. Hutchinson is widely known in both the plumbing and heating indus-

20 lb. I.C.C. Cylinders

Light Weight—National Tube

IMMEDIATE Delivery

With No. 136 Weatherhead Cylinder Valve

1 to 24 ..... 12.50 ea. F.O.B. Houston
25 or more ..... 12.00 ea. F.O.B. Houston

Without Valve

1 to 24 ..... 11.00 ea. F.O.B. Houston
25 or more ..... 10.00 ea. F.O.B. Houston

Limited Stock—Immediate Delivery
Viking L-124 Pumps, 90 Gals. P.M.

Ellis Butane Equipment Co.

P. O. Box 6267 4501 Greely, Houston 6, Texas

GAS EQUIPMENT COMPANY, Inc.

P. O. BOX 566
2620 South Ervay « DALLAS, TEXAS

GEC GAS EQUIPMENT COMPANY

Complete
ONE STOP
SERVICE
For all L.P.
GAS EQUIPMENT

CORKEN
BULK PLANT PUMPS
TRUCK PUMPS
SMITH METERS
O.I.C. VALVES
ENGINEERING SERVICE

WRITE FOR CATALOG

Rego Fittings	Flare Fittings
Harman Pumps	Butane-Propane Hose
Viking Pumps	Boss Couplings
Range Connectors	Strainers
Heater Connectors	"U" Joints
Orifices	Sight Flow Gauges
Power Take-Offs	Hand Pumps
Flexible Shafts	Copper Tubing
J & S Carburetors	And Many Others

We can install bulk plant pumps and piping complete. We have a complete truck pump mounting service.

THE ALAN W. BOWSER CO.
1816 COCKRELL ST. DALLAS 2, TEXAS

try and the gas industry, having been associated for the past 19 years with the Bastian-Morley Co. of La Porte, Ind. He resigned his position as sales manager of that firm in February and joined Lawson on April 1.

Currently he is serving as a member of the AGA Residential Water Heating Committee, AGA Residential House Heating Committee and the GAMA Water Heater Promotional Committee.

HERBERT FRITZ

Roberts & Mander Corp., Hatboro, Pa., makers of "Quality" appliances, has announced the appointment of Herbert E. Fritz as sales promotion manager.

Although he will make his headquarters in the home office of the company, Mr. Fritz will spend the major portion of his time in the field conducting dealer meetings and demonstrations, and arranging for trade and consumer shows and other promotional activities.

Mr. Fritz has been connected with Roberts & Mander Corp. since 1938, and has served successively as credit manager, service manager, and sales representative.

Household Products Co., distributors of **Servel** products in northern California has moved to a new office and warehouse building at 2783 East Twelfth St., Oakland.

A centrally located display room is provided for convenience of dealers in the new building, which includes extensive office facilities, spur track and ample warehouse space.

17 YEARS LP-GAS EXPERIENCE

IN

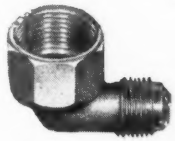
OLD MEXICO

Representing and Warehousing
All Types of LP-Gas Equipment

C. R. HOJEL AND CO.
Calle Londres 163
Mexico City, Mexico
Phone 36-57-08

QUALITY • W-K Products • SERVICE

Standard S.A.E. Flare-Type Brass Fittings for the L.P. Gas Industry the World Over



• • •

Forged Range Fittings, Nuts and Tees

• • •

Gas Cocks, Reducer Bushings, Tube Straps

• • •

Sold Exclusively Through the Jobber

JOBBERS: Write for our special personalized catalog and dealer order blank program.

U.S.A.

Winn & Kuhn Co.
1833 NICOLLET AVE. MINNEAPOLIS, MINN.

THE ONLY gas range connector using malleable iron fittings . . . a heavy flared tube fitting combined with special alloy aluminum tubing with *.049" wall thickness.* UNDERWRITERS APPROVED for all gases.

EASY DOES IT. The long 10° tapered cone of a Superseal fitting assures permanently gas-tight seal. There's no need to be "brutal" when tightening the nut, but you need not fear shearing the tubing or damaging the fitting. Tubing bends sharply close to the fitting — for flush-to-wall installations.

COMPETITIVELY PRICED. Available in any combination of elbows and straight fittings. Write for complete description. Over 400 U. S. Distributors . . . one near you.

Superseal
DIVISION
COLUMBIA MALLEABLE
CASTINGS CORPORATION
COLUMBIA, PA.

The appointments of James R. Butler as Western regional manager of sales promotion and Frederick J. Blume as Eastern regional sales promotion manager for **Rheem Manufacturing Co.** have been announced by R. Louis Towne, sales promotion manager.

Prior to joining Rheem, Mr. Butler was factory representative for Westinghouse Electric Corp.

Mr. Blume was formerly regional sales manager for Eastern Industries Corp., Inc., of New Haven, Conn.

Mr. Butler will make his headquarters in the company's San Francisco office and Mr. Blume will make his in New York.

F. J. BLUME

JAS. R. BUTLER

The appointment of Harold P. Wolf as assistant manager of the commercial research department of the Rheem Manufacturing Co. has been announced by Carl J. Dinic, commercial research manager.

Prior to joining Rheem, Mr. Wolf was a consultant in the New York and Chicago offices of Booz, Allen & Hamilton, management engineers, and before that was a research analyst for United States Steel Corp., of Delaware.

Perfection of a unique, completely mechanized process of hot dip galvanizing is announced by Rheem as the

Quality PRODUCTS

BUY WITH CONFIDENCE

NATIONAL *Service*

Brass Fittings
Copper Tubing
Tools for Tubing
Valves and Cocks
Orifices and Kits
Specialty Items

DEPENDABLE SERVICE *for the* LP-Gas Industry

Prompt Shipment

Write for catalog and full details

Emblem of Quality
Imperial Distributors

★ MIDLAND ★
PARTS & BEARINGS CO.
IRVING, KANSAS
1418-A Grand Ave., Kansas City, Mo.

JOHNSON
LP-GAS BURNING EQUIPMENT

Every industrial user a live prospect

• Hand torches - Bench soldering furnaces - Ring burners - Urn burners - Drilled pipe burners - Bunsen burners of all types.

When you sell Johnson—
You sell the Best

Write for Catalog and Details

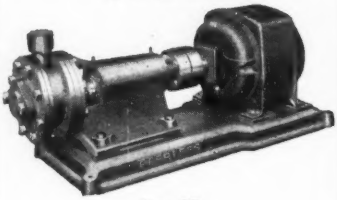
Automatic Hand Torches

For pre-heating, singeing poultry, sweating joints, etc. Intense heat with famous Johnson Direct Jet Burners. Equipped with lever handle and pilot light. Available in two sizes. Write for information.

JOHNSON GAS APPLIANCE CO. (Since 1901)
595 E AVENUE N.W., CEDAR RAPIDS, IOWA

For
Butane-Propane
SERVICE
PEERLESS
TURBINE (VANE)
PUMPS

For High Heads and Capacities up to 150 G.P.M.



Type XT

For efficient, low cost liquefied petroleum gas services including 1 p-g bottling, tank storage, truck, tankcar transfer, etc.

Most advanced in design and construction for maximum service and dependability.

Write for Details

PEERLESS PUMPS

Peerless Pump Div.
Food Machinery Corporation
Canton 6, Ohio — Quincy, Illinois
Los Angeles 31, Calif.

result of more than 20 years of both practical experience and research. This process is used on steel shipping containers as well as tanks manufactured by the company.

Tests prove that tanks galvanized by this precisely controlled process give greatly extended service.

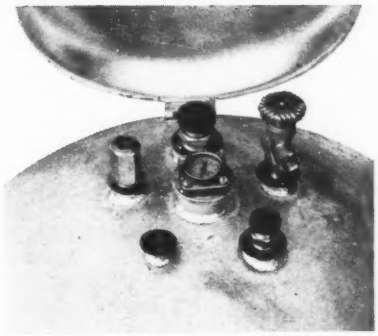
The tank is not completely fabricated before galvanizing as is customary. The head is welded in place but the bottom is left unattached. The bottom is processed separately and welded into place after galvanizing.

T. A. ST. CLAIR

O. G. SCHWENK

T. A. St. Clair has been appointed development engineer for the **Weatherhead Co.** LP-Gas division, it is announced by Albert J. Weatherhead, Jr., president of the Cleveland concern.

He was previously associated with the Phillips Petroleum Co. at Bartlesville, Okla., where he first worked as an assistant in the chemical research department. Most of his 14 years with Phillips Petroleum were spent in the liquefied petroleum gas equipment development department. He was in charge of this group for the past eight years. Mr. St. Clair studied mechanical engineering at the University of Oklahoma. His new activities at Weatherhead will be focused



for Safety's Sake

Look Under the Cap

Only the best LPG fittings are used on Superior tanks. All are UL approved. Fittings on sphere at left include: 1¼ in. filler, ¾ in. safety (area .300 sq. in.), 10% outage, ¾ in. vapor return, ¾ in. POL vapor supply with 250 lb. safety (area .100 sq. in.) and 1½ in. magnetic Criterion gauge.

Be Safe With Superior

Superior Tank & Construction Co.

6155 So. Eastern Ave. • AN 4157 • Los Angeles, California

RAPID MOISTURE REMOVERS

Eliminate

MOISTURE FREEZE-UPS

Install NOW for year around constant gas service!

- Safe to use
- Easy to install
- Equipped with standard LH-P. O. L. fittings
- Available in a variety of sizes
- Refillable — can be used indefinitely
- Protects regulator from scale and dirt

Your Wholesaler Can Supply You

Fine **PRODUCTS CO.**

185 NORTH WABASH AVENUE • CHICAGO 1, ILLINOIS

8 FEATURE REFRIGERATOR TRUCK

1. All joints arc-welded.
2. 12" General Tires with separate tubes.
3. Roller or ball bearings.
4. Loops hold straps securely.
5. Sweeping axle hangers aid loading, stair climbing, etc.
6. Extra brace supports axle.
7. Roomy, strong 5" x 25" toe-plate.
8. Padded strips protect refrigerator, hold it secure.

CYLINDER TRUCK

Designed Exclusively
FOR
L. P. Cylinders.

10" Pneumatic Tires. Weighs only 23 lbs.

Model 7325.

ORDER
FROM YOUR DISTRIBUTOR
NOW!

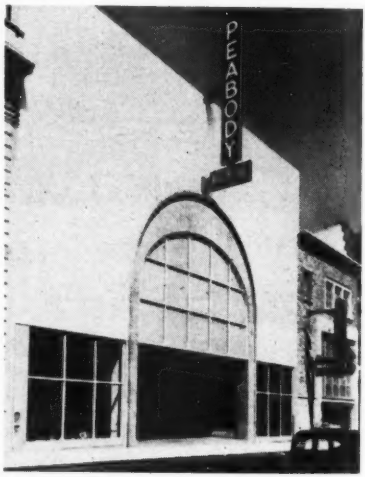
MOLLENBROCK And WILKE
WASHINGTON, MISSOURI

upon product development and safety research on all LP-Gas equipment.

O. G. Schwenk, general production manager of Weatherhead, has been appointed assistant to the president, it is announced.

R. J. Finnegan has been appointed to the position of general production manager of the company. He will assume the responsibilities formerly carried by Mr. Schwenk. Mr. Finnegan, who was previously chief industrial engineer, joined Weatherhead in 1941.

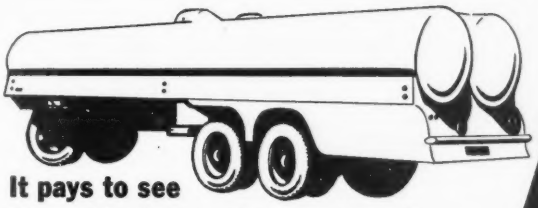
The Henry W. Peabody & Cia. Argentina Limitada has been appointed Argentina distributor for the



Office of Peabody & Cia., Argentina distributor for Weatherhead Co.

complete line of Weatherhead refrigeration and industrial products, it is announced by Heyliger Church, vice president in charge of sales of Weatherhead.

Peabody & Cia. will also act as



It pays to see

Liquefied Gas Equipment Corp.

2014-20 Wyandotte St. Kansas City 8, Mo.
Phone: BAltimore 0430

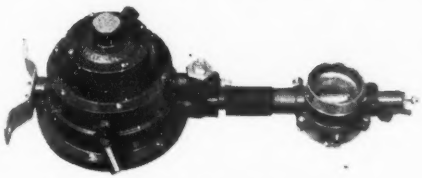
for EVERYTHING in Delivery and Storage Equipment ...Tops in Service and Value!

Transports
Tank Trucks
Storage Tanks
I.C.C. Cylinders
Pressure Vessels
Domestic Systems
Industrial Systems
Accessory Equipment and Complete
BULK PLANTS

Immediate Delivery of 100 lb. 4B240 I.C.C. CYLINDERS direct from stock!

Products engineered to your needs. plus helpful counsel on any problem ...based on long, wide experience

We Build Combination Units Only



Features of Dix LPG Units

- Permanent Mold Castings
- Stainless Steel Valves
- Controlled Water Temperature
- Simplicity of Installation

We Carry in Stock . . .

TRAPIT FILTERS . . . they are outstanding for LPG
ELECTRO BUTANE-PROPANE FUEL ANALYZERS . . . give positive proof of correct installations.

Every Dix unit is for combination use with LPG and gasoline. The Dix Company is the only one manufacturing carburetion equipment that specializes exclusively in this type of unit. The Dix combination can be used on any make or model of internal combustion engine . . . without disturbing the gasoline equipment. This means that installation can be made faster, cheaper and better.

Write for Descriptive Catalog

Dix Manufacturing Co.

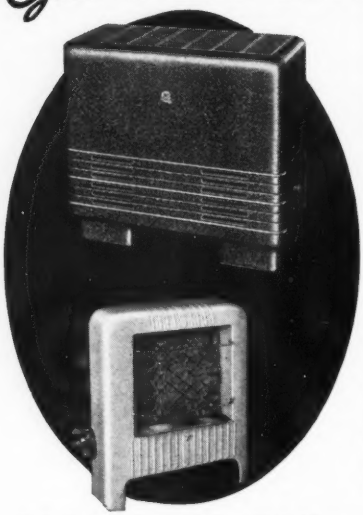
3447 E. Pico Blvd.
Los Angeles 23, Calif.

New!

1948 MODELS

Peerless

Gas **Circulators • Heaters**



A. G. A. approved for Nat'l, Mfgd, Mixed, and L. P. Gases.
Vented Circulators—two new styles—4 sizes each.
New Floor Type Bathroom Heater.
Radiant Heaters—three new styles.
Write today for new descriptive literature.

Peerless

MANUFACTURING CORPORATION

INCORPORATED

LOUISVILLE, KENTUCKY

Argentina sales representative for Weatherhead LP-Gas equipment and fittings.

The appointments came as the result of an extended trip through South American countries recently completed by Weatherhead's export manager, Alva T. Spring. The Peabody organization has its headquarters in Buenos Aires, has been in business for over 16 years.

Superior Valve & Fittings Co. announces the appointment of William H. Kramer as manager of its Chicago office and warehouse. Mr. Kramer succeeds I. A. Wilson who has been transferred to Pittsburgh as sales manager of the company.

WM. H. KRAMER

Mr. Kramer has had varied and extensive experience in the industry, having been employed since 1941 by Minneapolis-Honeywell Regulator Co., starting in their Detroit office, and later transferred to Chicago as supervisor of sales of refrigeration controls and special control applications throughout the Midwest.

Ruud Manufacturing Co., Pittsburgh, has announced the appointment of K. M. Thompson as district representative in Iowa. Mr. Thompson will handle the complete Ruud line of gas water heaters, including Ruud-Monel, for residential, commercial and industrial purposes.

Previously he had been associated with the Philgas Division, Phillips Petroleum Co., for eight years. He will make his headquarters in Mt. Vernon, Iowa.

Service — en route to you!

Utility LP-GAS SYSTEMS — *World famous* • • •

ALL SIZES ARE AVAILABLE AT OUR PLANT

ASME-API, ASME CODES • NATIONAL BOARD INSPECTION • •

for surface or underground —*Quality Unsurpassed*

A CARAVAN OF *Utility* SYSTEMS DAILY BECOMES A MOVING BILLBOARD FROM OUR PLANT TO DEALERS—WHEREVER THEY MAY BE. WE MAINTAIN A FLEET OF TRUCKS FOR READY DELIVERY.

SPECIAL PRODUCTION OF: — *PROPANE* —

300 GALLON — 500 GALLON — 935 GALLON

BUTANE EQUIPMENT CO., INC. 3301 S. LAMAR, DALLAS, TEXAS

Butane & Propane

Producers of high quality
Liquefied Petroleum Gases Since 1931
Wholesale Only

THE CARTER OIL COMPANY

TULSA, OKLAHOMA

your most dependable source of brass fittings

a complete line of brass fittings for copper tubing installations for gas and oil line use.

Write for Catalog LP-1

C-S

BRASS MFG. CO.

148 W. 62nd St., New York 23, N. Y.
PLaza 7-2295

E. V. BISHOFF

E. V. (Gene) Bishoff, Jr., has been appointed to the sales engineering staff for Emco products. The announcement was made by W. R. McLaughlin, sales manager of the Pittsburgh Equitable Meter Division of **Rockwell Manufacturing Co.**

Mr. Bishoff has been assigned specifically to the promotion of Emco gas appliance regulators and flow indicating meters.

He came to Rockwell in November, 1946, as a project engineer and has devoted his efforts to engineering and development of the gas appliance line and all related products which the company manufactures.

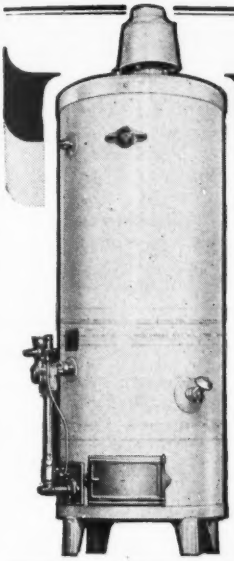
W. M. Myler, assistant treasurer of Rockwell Manufacturing Co. retired on March 31 after serving the firm for 46 years.

Recently established in Cleveland, the **Baird-Foerst Corp.** will provide distributorship for the A. O. Smith Corp., manufacturers of Smithway "Permaglas" gas and electric water heaters, and the Burkay instantaneous water heater for commercial use.

Ken O'Gorman, regional manager appliance sales department, says that the new territory will cover 16 counties in Northern Ohio.

W. J. Baird, who will head the corporation along with Mr. H. Foerst, was formerly general manager of the American Utilities and was sales representative for the Ohio Fuel Gas Company.

Hal Foerst leaves his post as sales manager of the American Utilities in Cleveland to join Mr. Baird.



Outstanding

Quality...Styling...Value

Greater grows the demand for SECURITY Automatic Hot Water Heaters. More and more buyers seek the smart appearance, dependable performance, superior workmanship for which SECURITY is famed. Thousands of users are amazed at the efficiency, economy and long life of these gleaming Automatic Water Heaters. Operate on all fuel gasses. Now is the time to look to SECURITY . . . for leadership and for sales!

SECURITY

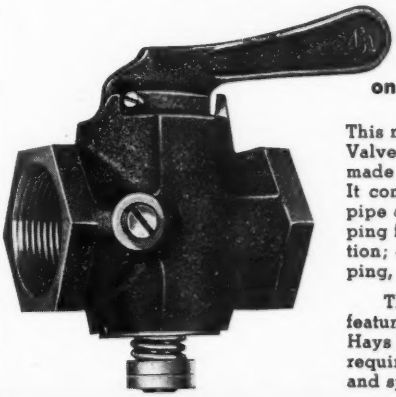
GAS FIRED SGP **PRODUCTS**

The "LONG-LIFE" LINE

SECURITY MANUFACTURING CO.

KANSAS CITY 3, MO.

. . . . with Pilot Tapping



A. G. A. Approved

for LP Gas

on Appliances and Equipment

This new Hays Manual Main Gas Control Valve for automatic gas appliances is made in a full line of sizes from ⅛" to 2". It comes in two styles, for female iron pipe or union outlet. It has ⅛" pilot tapping for right hand or left hand connection; or can be supplied with double tapping, for connection on either side.

This new valve has all the quality features which distinguish the entire Hays line of bronze fittings. Send us your requirements for complete information and specifications. Write for Folder 107

HAYS MANUFACTURING CO., ERIE, PA.

It is with pride and a sense of great responsibility, that Viking has pioneered a pattern for the rotary pump field.
The pace, set by Viking for more than a third of a century, has stood this test of time. When you are in need of pumps, it will pay you to do as others have done, consider the original "gear within a gear" Viking first. You will find a decided difference.
Look to Viking for the answer to your pumping problem.

Send for free bulletin 2300B today. It will be forwarded at once.

VIKING PUMPS
VIKING PUMP CO. CEDAR FALLS OHIO
See Our Catalog in SWEETS
VIKING
PUMP COMPANY
Cedar Falls, Iowa

In an expansion move unprecedented in its 42 years of distributing household appliances in San Francisco, the **H. R. Basford Co.** moved on May 1 to 235 15th St., where the company now occupies a recently purchased building providing 60,000 square feet of warehouse and office space, it is announced by G. P. Egleston, president and general manager.

Among products distributed by the Basford Co., are Ruud-Monel water heaters, Fraser gas heating equipment and Sprague gas meters.

C. L. Hewitt, Jr., general sales manager of the **L. J. Mueller Furnace Co.**, Milwaukee, has been elected chairman of the Boiler Division of the Gas Appliance Manufacturers Assn. The election occurred at the association's annual meeting recently held in Chicago.

Mr. Hewitt, whose term of office is one year, is responsible for coordinating the gas boiler manufacturer-member activities of GAMA.

Tappan Now Building "CP" Ranges for LP-Gas Trade

Production of Tappan LP-Gas ranges built to "CP" standards began on last January 25, announces A. B. Rizenthaler, vice president in charge of sales for the Tappan Stove Co., Mansfield, Ohio.

This production followed almost immediately the decision of the Gas Appliances Manufacturers' Association, owner of the "CP" trademark, to license the use of the "CP" seal on LP-Gas ranges which comply with certain high performance and safety standards.

No special experimental work was required to adapt Tappan LP-Gas ranges to the new "CP" requirements,

ECONOMY *DeLuxe* GRIDDLE RANGES

Economy DeLuxe Griddle Range, Model 5382
Four open burners—deep polished cast iron griddle.

BEAUTY THAT LASTS — For small commercial installations, there's instant sales-appeal in the enduring beauty of Economy DeLuxe Griddles—nickel chrome stainless finish contrasting with jet black porcelain.

FAITHFUL PERFORMANCE — When you install an "Economy" you provide your customer with trouble-free equipment, designed and built with sturdy precision, for which the Economy line is famous in the restaurant field.

A MODEL FOR EVERY JOB—Six models of Griddle Ranges—and you can shift the griddle plates to any position on the top without tools. Send for catalog NOW—showing the full line of ECONOMY Griddle Ranges, Cafe Ranges and Barbecue Oven for LP-Gas.

COMSTOCK-CASTLE STOVE CO. Quincy, Illinois

THIS **PROPANE STORAGE TANK . . .**

fabricated by **DOWNINGTOWN IRON WORKS, INC.**

The demand for Propane Storage tanks continues. The plate situation appears to be as critical as ever, possibly more critical, therefore, we suggest users of these tanks try to anticipate their requirements. Propane Storage tanks fabricated by us are built to A.S.M.E. specifications and comply with Hartford and National Board of Fire Underwriters' requirements. Our more than 30 years experience is at your service . . . consult us.

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DOWNINGTOWN IRON WORKS
DOWNINGTOWN, PA.
WELDED and RIVETED PRODUCTS

ASK FOR • INSIST ON •
STANDARDIZE WITH •

BRASS FITTINGS
AND
ACCESSORIES

The recommended fitting for

L-P GAS
PLUMBING
REFRIGERATION
OIL INSTALLATIONS

We are proud to announce our affiliation with the following nationally known concerns and their products as distributors:

Rector Well Equip.
Gas Specialty
Odin Stove Mfg. Co.
Papco Company
American Gas Machine
Mollenbrock & Wilke
Webb Mfg. Co.
Hudson-Hart
Tanner Mfg. Co.
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Write for our illustrated
"FLARON"
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Jobbers in principal cities

SCHAAF BROS., INC.
OSBORN, OHIO

inasmuch as the current Tappan models already were found to comply to them when automatic oven ignition with 100% shutoff of the oven pilot was added. Tappan City gas models with automatic oven ignition, having already been equipped with 100% shutoff of the oven pilot, made it a simple matter to apply that system to the LP-Gas models. As a result, Tappan butane-propane dealers were the first in the entire industry to obtain these ranges bearing the "CP" seal, according to Mr. Ritzenthaler.

Introduction of ranges built to "CP" standards into the LP-Gas field is an event of major significance. It means that now, for the first time in history, LP-Gas ranges can be supplied with clock control of oven, a feature that until now has been one of the principal boasts of the electric range industry. Dealers are now in position to offer that identical convenience to all gas users, in addition to the advantages of speed and flexibility that only gas provides.

Tappan LP-Gas ranges built to "CP" standards are now in regular production.

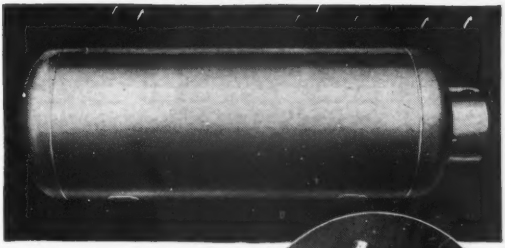
Florida Town Puts 10% Tax on Bottled Gas

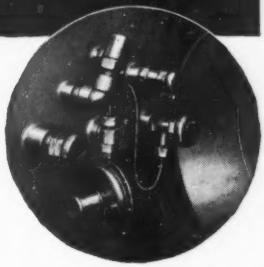
A Florida town imposed a 10% tax on bottled gas and telephone service, despite requests by gas dealers for a two-week respite to work out arrangements "more practicable" for both the city and the dealers.

The place is Homestead, Fla., where electricity rates have already been raised 10% over the protest of local civic leaders.

M. D. Jacobsen, Homestead Gas Co., and Virgil D. Lyon, local gas dealer, registered desires for postponement and protest against the "discriminatory" measure.

Basalt PROPANE STORAGE TANKS





...display Quality Workmanship

FINEST QUALITY workmanship is evident in all Basalt Propane Storage Tanks. Skilled craftsmen, using the best materials and employing the latest equipment, turn out *extra quality* tanks that are designed and tested to measure up to your complete satisfaction. Write for full information.

BASALT STEEL PRODUCTS DIVISION
BASALT ROCK CO., INC., Napa, California

Safety is First with REGO LP GAS EQUIPMENT

See Bastian-Blessing ad on Pages 153, 154, 155, 156 for Details on the Outstanding Safety Features of the RegO Line of LP-Gas Equipment.

exclusive factory distributor

REGO LP GAS EQUIPMENT

In
ARIZONA
CALIFORNIA
IDAHO
MONTANA
NEW MEXICO
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OREGON
UTAH
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THE NEW HAMMEL
FLOOR FURNACE...

Born for the average home where the original cost, installation, space and upkeep is a major consideration . . . Ruggedly constructed with electrically welded heating element; combination single pilot and burner valve with latching device; gas pressure regulator; cast iron observation cap, with clear mica window and chamber sealed with asbestos gasket. Shallow design eliminates pit, basement, ducts or pipes. Input rating full 45,000 BTU per hour on either natural or manufactured gas.

ONLY GENUINE HAMMEL PRODUCTS CARRY THIS TRADEMARK
. . . A SYMBOL OF TESTED AND APPROVED QUALITY

Hammel
RADIATOR ENGINEERING CO.
Owned and Operated by A. S. Mortinson and Associates
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Andres Borromeo, Philippine Gas Operator, Dies Suddenly

Andres Borromeo, Jr., manager of Inter-Island Gas Service, Quezon City, Philippine Islands, since its organization in 1939, passed away May 3 of a heart attack in his home city. He was 43 years old.

ANDRES BORROMEO

Mr. Borromeo has been eminently successful in the distribution of LP-Gas in the Philippines since he and his uncle Canuto Borromeo, received their first shipment of gas on Jan. 1, 1940, from the Imperial Gas Co., of Los Angeles.

The first few months of his efforts were devoted to experimenting in the actual use of "Rockgas" in pre-war hot plates and stoves and when he had definitely established the feasibility of the fuel, he began an extensive sales campaign. The first user to sign up was Mrs. Aurora A. Quezon, wife of the first president of the Philippines.

When the war broke out and the Japanese occupied Manila, Mr. Borromeo stopped doing business. Several Rockgas tanks and gas equipment belonging to his firm were looted and taken at the point of bayonets by the soldiers and officers of the Japanese Imperial army.

During the occupation some of their tanks were hidden in Paco, Manila, and in Muntinlupa, Rizal, in the house of Capt. Manuel Liwanag. In Cebu City, where the company's bulk storage tank was kept, there

Wayne BRASS CO.
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"Where Quality Tells, and Price Sells."

Write for illustrated price list on the approved L.P. Gas fittings

Brass Fittings • Copper Tubing

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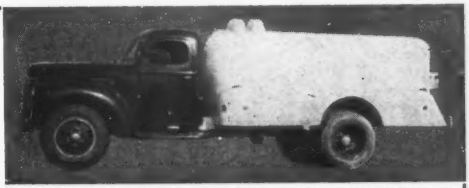

PROPANE TRUCK TANK MANUFACTURE

(ASME Code Par. U-69)

1181 Gal. Water Capacity
Rego Safety Valves
Rego Excess Flow check valves
Corken Pump with bypass feature
50 feet each liquid & vapor hose

Completely streamlined
ICC Lights
Tool cabinet in skirting
Hose cabinet at rear
Painted white enamel

Complete—Ready to operate—Pump from storage—Fill domestic bulk plant systems—Fill bottles. Meters optional. We can help you secure 1½ to 2½ ton trucks for above tanks. Domestic Propane Systems from 353 to 1176 gallons water capacity, Rego Equipped.

McNAMAR & CROWLEY, INC.

P.O. Box 210 SALEM, ILLINOIS Phone 690

STEEL TANKS AND PRESSURE VESSELS

were hundreds of Rockgas tanks piled up and some of these tanks were hidden at the Convent of the Recoletos at San Augustin church and at San Carlos college.

Mr. Borromeo had unusual business sagacity, according to his associates, and after his death one of his American friends stated, "he was a man of the highest business acumen, the only Filipino I ever knew who could compare with any American businessman in the States."

He graduated from Massachusetts Institute of Technology in 1936 as a mechanical engineer and was first attracted to the LP-Gas industry by a published article which described methods of distributing gas in cylinders in outlying communities.

He is survived by four sisters, one of whom, Miss Gilda Borromeo, resides in Monrovia, Calif.

Jose Borromeo is acting as manager of Inter-Island Gas Service pending the election of a permanent manager by the board of directors.

HELCO

HELCO LP-Gas Low Pressure Regulators Are Designed For

Safety First

Helco Products Corp.

(Formerly H. E. Lynn and Co.)

2041 Colorado Ave.

Santa Monica, Calif.

"Suburban Gas Service" Formed By New California Syndicate

A public offering of $500,000 worth of 12-year sinking fund debentures was offered early in May in Los Angeles for the newly incorporated "Suburban Gas Service, Inc." They will bear 6% interest and will be due in 1960. The offering is made by Lester & Co. and Wagenseller & Durst, Inc.

Officers of the company are W. R. Sidenfaden, president; H. E. Owens, vice president and treasurer, and R. C. Harris, vice president and secretary. Headquarters of the company are in Ontario, Calif.

The company is engaged in the distribution and sale of liquefied petroleum gas in suburban and rural areas of southern California located beyond the gas mains of gas utilities.

It was organized in January of this year to acquire the business and assets of Home Gas Co. and Rural Gas & Appliance Co. operating in Beaumont, Redlands and Ontario. Proceeds from the financing will be used to acquire the California Butane Co., which operates in the rural areas surrounding Los Angeles, Santa Ana, Colton, Imperial, Santa Maria, Beaumont and Ontario, and the unincorporated town of Castaic, all in California.

Big Chief Butane Purchases Plant in Ada, Okla.

Otto Doner, Frank Streetman, and J. A. Reynolds have purchased the McCurley Butane Co., Ada, Okla.

The organization is to operate under the name of Big Chief Butane Co., and has a capital stock of $8000.